LIBRARY OF PRINCETON
NOV 19 2002
THEOLOGICAL SEMINARY

Digitized by the Internet Archive
in 2016

https://archive.org/details/journalofasiatic1415asia

JOURNAL

OF THE

ASIATIC SOCIETY

OF

BENGAL.

EDITED BY

THE SECRETARY.

VOL. XIV.

PART I.—JANUARY TO JUNE, 1845.

Nos. 157 to 162.

NEW SERIES.

"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of Asia will commit their observations to writing, and send them to the Asiatic Society, in Calcutta; it will languish if such communications shall be long intermitted; and will die away if they shall entirely cease."—SIR WM. JONES.

CALCUTTA:

BISHOP'S COLLEGE PRESS.

1845.

Contents.

PART I.

No. 157.

No. 158.

No. 159.

No. 160.

No. 161.

No. 162.

Index

TO PART I. VOL. XIV.

INDEX TO NAMES OF CONTRIBUTORS

TO PART I. VOL. XIV.

OFFICERS OF THE ASIATIC SOCIETY FOR 1845.

—o—

PRESIDENT.

Right Hon'ble Sir Henry Hardinge, G. C. B. Governor General of India.

Vice-Presidents,..
- The Right Revd. The Lord Bishop of Calcutta.
- The Honorable Sir J. P. Grant.
- The Honorable Sir H. Seton.
- H. W. Torrens, Esq.
- Lieut.-Col. W. N. Forbes, B. E.

Secretary, H. W. Torrens, Esq.
Sub-Secretary, H. Piddington, Esq.

Committee of Papers.

Dr. J. Hæberlin,	S. G. T. Heatly, Esq.
Lieut. A. Broome, B. H. A.	W. Grant, Esq.
C. Huffnagle, Esq.	W. Seton Karr, Esq., C. S.
Baboo Prosonno Comar Tagore,	W. B. O'Shaughnessy, Esq., M. D.

Corresponding Members, Committee of Papers.

V. Tregear, Esq.	A. Sprenger, Esq., M. D.
Capt. Boileau, B. E.	G. G. Spilsbury, Esq., M. D.
Lieut. Phayre, B. N. I.	Lieut. Tickell, B. N. I.
Capt. Cunningham, B. N. I.	

Curator Zoological Department Museum, E. Blyth, Esq.
Curator Geological and Mineralogical Departments and Museum of Economic Geology, H. Piddington, Esq.
Librarian, Dr. E. Roer.
Accountant and Assistant to the Secretary, Mr. W. H. Bolst.
Assistant Librarian, Mr. J. Tucker.
Taxidermist, Mr. J. Nicolas.
Treasurers, Bank of Bengal.
Agent in London, Professor H. H. Wilson, India House.
Agent in Paris, Major A. Troyer, 55, Rue de la Pepiniere.
Booksellers and Agents in London, Messrs. W.& J. Allen, Leadenhall street.

LIST OF MEMBERS

Of the Asiatic Society of Bengal, on 1st January, 1845.

Alexander, Esq. Jas.
Anderson, Major W.
Avdall, Esq. J.

Baker, Capt. W. E.
Barlow, Esq. R.
Barwell, Esq. A. C.
Batten, Esq. J. H.
Bayley, Esq. H. V.
Beaufort, Esq. F. L.
Benson, Lieut.-Col. R.
——— Esq. W. H.
Birch, Lt.-Col. R. J. H.
Birch, Capt. F. W.
Bishop of Calcutta, Rt. Rev. Lord.
Bogle, Major A.
Borradaile, Esq. Jno.
Boutros, Esq. F.
Bowring, Esq. L. B.
Boys, Capt. W. E.
Brandreth, Esq. J. E. L.
Broome, Lieut. A.
Buckland, Esq. C. T.
Bushby, Esq. G. A.

Cameron, Hon'ble C. H.
Campbell, Esq. A.
Cautley, Capt. P. T.
Cheap, Esq. G. C.
Christopher, Esq. A.
Colvin, Esq. B. J.
Connoy Loll Tagore, Baboo.
Corbyn, Esq. F.
Cust, Esq. R. N.

Davidson, Esq. T. R.
Dunlop, Esq. A. C.
Durand, Capt. H. M.
Dwarkanath Tagore, Baboo.

Earle, Esq. W.
Egerton, Esq. C. C.

Forbes, Lieut.-Col. W. N.
Fulton, Esq. J. W.
Furlong, Esq. Jas.

Gilmore, Esq. Allan.
Grant, Esq. J. W.

Grant, Hon. Sir J. P.
——— Esq. W. P.
Gladstone, Esq. M.
Goodwyn, Capt. H.
Ganthony, Esq. R.
Grant, Esq. J. P.

Hopkinson, Capt. H.
Hayes, Lieut. Fletcher.
Heatly, Esq. S. G. T.
Hæberlin, Dr. J.
Huffnagle, Esq. C.
Hannay, Capt. F. S.
Houstoun, Esq. R.
Hill, Esq. G.
Hickey, Lieut. C. E.
Hodgson, Major-General J. A.

Irvine, Lieut.-Col. A. (C. B.)

Jackson, Esq. W. B.
Jenkins, Major F.
Jameson, Esq. W.

Karr, Esq. W. Seton.

Laidley, Esq. J. W.
Lushington, Esq. G. T.
———— Esq. E. H.
Loch, Esq. G.

Maddock, Hon. Sir T. H.
McQueen, Rev. J.
Muir, Esq. J.
Mouat, Esq. F. J.

McKilligin, Esq. J. P.
Marshall, Capt. G. T.
Mill, Esq. J. B.
McLeod, Esq. D. F.
——— Capt. W. C.

O'Shaughnessy, Esq. W. B.
Ouseley, Lieut.-Col. J. R.
Ommanney, Esq. M. C.
Owen, Esq. Jno.

Prinsep, Esq. C. R.
Pourçain, Esq. J. St.
Peel, Hon. Sir L.
Prosonoo Coomar Tagore, Baboo.
Phayre, Lieut. A. P.
Pratt, Rev. J. H.

Quintin, Esq. W. St. Quintin.

Robison, Esq. C. K.
Ramgopaul Ghose, Baboo.
Ramnath Tagore, Baboo.
Rustomjee Cowasjee, Esq.
Rawlinson, Major H. C.
Ravenshaw, Esq. E. C.
Ryan, Esq. E. B.
Radhakant Deb, Behadoor Raja.

Strong, Esq. F. P.
Strachey, Lieut. H.
Stacey, Lieut.-Col. L. R.
Storm, Esq. W.
Seton, Hon. Sir H. W.
Sleeman, Lieut.-Col. W. H.

Sutchurn Ghosaul, Behadoor Raja.
Stirling, Esq. E. H.
Spilsbury, Esq. G. G.
Shortrede, Capt. R.
Smith, Lieut. R. Baird.
Stephen, Capt. J. G.

Tickell, Lieut. S. R.
Thomason, Hon'ble J.
Torrens, Esq. H.
Trevor, Esq. C. B.
Torrens, Esq. J. S.
Taylor, Lieut.-Col. T. M.

Walker, Esq. H.
Willis, Esq. J.
Withers, Rev. Principal G. U.
Walker, Esq. R.
Ward, Esq. J.
Wilcox, Major R.

Young, Lieut. C. B.

Associate Members.

Blyth, Esq. E.
Long, Rev. J.
McGowan, Dr. J.
Syud Keramut Allee.

Oriental Publications for Sale, at Reduced *prices, by the Asiatic Society.*

Works.	Rs.	Former Price.
Mahábhárata, vol. 1st, pages 831, vol. 2d, pages 868, vol. 3d, pages 859, vol. 4th, pages 1007, royal 4to.	40	48
Large paper do. do.	50	60
Index to the 4 vols. of the Mahabharut complete.	6	1
Harriwansa, 563 pages, royal 4to.	5	6
Rája Tarangini, 440 pages, 4to.	5	20
Large paper, do. do.	8	12
Naishada, 917 pages, 8vo.	6	6
Sausruta, 1st vol. 378 pages, 2d vol. 562 pages, 8vo.	8	8
Fátawé A'lemgírí, 1st vol. 763 pages, 2d vol. 759 pages, 3d vol. 565 pages, 4th vol. 759 pages, 5th vol. 697 pages, 6th vol. 667 pages, royal 4to., per vol. ...	8	10
Ináya, 2d vol. 690 pages, 3rd vol. 682 pages, 4th vol. 937 pages, 4to. ...	8	10
Kházánat ul Ilm, 694 pages, 4to.	8	10
Jawáme ul Ilm ul Riazí, 168 pages, with 17 plates, 4to.	4	4
Anis ul Musharrahín, 541 pages, 4to.	5	5
Sharaya-ool-Islam, 631 pages, 4to.	8	15
Tibetan Grammar, 256 pages, 4to.	8	8
Tibetan Dictionary, 373 pages. 4to.	10	12
Asiatic Researches, per vol.	10	12
Burnouf Memoire sur deux inscriptions cunéiformes, 4to. 199 pp. ...	3	0
Burnouf Commentaire sur le Yacna, with notes &c. 2 parts, pp 945. ...	10	0

	Rs.	As.
Burnouf et Lassen, Essai sur le Pali, ou Langue Sacrée de la presqúile au de lá du Gange. Paris, 1826, pages 222, 8vo.	3	0
Elèmens de la Grammaire Japonaise, par M. M. Rodrigucz et Remusat. Paris, 1825, pages 158, 8vo.	3	0
Ditto ditto Supplément. Paris, 1826, pages 31, 8vo.		
Contes Arabes, traduits par J. J. Marcel. Paris, 1835, avec notes, vol. I. pages 484, vol. II. pages 496, vol. III. pages 508, 8vo.	3	0
Brosset, Elémens de la Langue Georgienne. Paris 1837, pages 122, 8vo. ...	5	0
Klaproth, Vocabulaire et Grammaire de la langue Georgienne. Paris, 1827, pages 232, 1st part, 8vo.	4	0
Cronique Georgienne, traduite par M. Brosset, Text and Translation. Paris, 1830, pages 370, 8vo.	3	0
Choix de Fables de Vartan, en Arménien et en Francais. Paris, 1825, pages 96, 8vo.	1	8
Elegie sur La Prise D'Edesse, en Arménien. Paris 1828, pages 112, 8vo. ...	2	0
Chrestomathie Chinoise—Chinese Characters, 1833, pages 183, 4to. ...	5	0
Meng-Tscu, texte Chinoisc, pages 161v, 8o.	3	0

Oriental Publications for Sale, at REDUCED *prices, by the Asiatic Society—(Continued.)*

	Rs.	As.
Meng-Tseu, traduction Latine, par S. Julien. Lutetiæ Parisiorum, 1824, pages 593, 8vo.	6	0
Lassen, Institutiones Linguæ Pracriticæ. Bonnæ ad Rhenum, 1837, pages 167, 8vo.	6	0
Lassen, Anthologia Sanscritica. Bonnæ, 1838, pages 371, 8vo. ...	4	0
Lassen, Gita Govinda, Sanscrit et Latine. Bonnæ ad Rhenum, 1836, pages 180, 4to.	2	8
Chezy, Yajnadattabada, ou La Mort D'yadjnadatta, Text, Analysis and Translation. Paris, 1826, pages 142, 4to.	3	8
Chezy, La reconnaissance de Sacountala, Text and Translation. Paris, 1830, pages 665, 4to.	10	0
Geographie D'Aboulféda, Texte Arabe. Paris, 1837-40, pages 586, 4to. ...	8	0
The Travels of Ibn Batuta, translated from the Arabic Manuscript, by S. Lea. London 1829, 143 pages, 4to.	6	0
The Travels of Macarius, translated by F. C. Belfour. London, 1829, pt. I. 114 pages, 4to.	4	0
Memoir of the Emperor Jehanguire, translated from the Persian Manuscript, by Major D. Price. London, 1829, 141 pages, 4to.	4	0
History of the Afghans, translated from the Persian, by B. Dorn, part I. London, 1829, 184 pages, 4to.	5	0
Han-Koong-Tsew, or the Sorrows of Han, a Chinese Tragedy, translated by J. F. Davis. London, 1829, 28 pages, 4to.	1	8
Vocabulary of Scinde Language, by Capt. Eastwick.	1	0
Leech's Grammar and Vocabulary of the Baloochi and Punjabee Languages. ...	1	0
Points in the History of the Greek and Indo-Scythian Kings, &c. Translated from the German of Professor Lassen, by J. H. E. Roer, and Edited by H. Torrens, Esq.	5	0

☞ Separate articles of the Journal are also reprinted, and sold at proportionate rates.

JOURNAL

OF THE

ASIATIC SOCIETY.

Mr. Ivory's Tables of mean Astronomical refractions, revised and augmented by Major J. T. Boileau B. E. *Superintending Magnetic Observatory Simla.*

The first of these Tables was published in the Philosophical Transactions of the Royal Society for 1823, pp. 491, et seq: and a second paper and Table by the same author, appeared in the Philosophical Transactions for 1838. The mean refractions for Zenith distances under 83° correspond exactly in both the above Tables, but the refractions differ for Zenith distances between 83° and the horizon.

In Table I. of the original (of 1838) the mean refractions are given for each degree only as far as *Z.* D. 70° inclusive, and thence for every 10′ to the horizon. In the accompanying Tables intermediate numbers have been obtained by interpolation to differences of the third and second order, and they have been so arranged that the tabular refractions for that part of the Table of most practical utility shall vary only between one and two seconds.

The numbers in the original Table for the last degree of Zenith distance, however, were found to give such irregular differences that the whole of the intermediate numbers between the limits of 89° and 90° have been obtained by differences to the third order, from the mean refraction for 89° i. e. 24′ 26.″8, and the horizontal refraction 34′ 32.″ And although the alterations which this arrangement has

introduced are of no practical importance, the following detail of the interpolations is inserted here as a guarantee for the course which has been adopted.

TABLE I. Interpolations between numbers as in the Original Table of 1838.

Zen. dist.	Mean refrac-tion,	Tab. diff. M.R.	d. 1	d. 2	d. 3
°	* ′ ″	″			
89.00	24:16.80				
	...	...	39.17		
05	25:05.97	80	...	1.66	
	* ...	...	40.83	...	+.17
10	25:46.80	...	...	1.83	
	...	...	42.66	...	+.15
15	26:29.46	87.10	...	2.08	
	* ...	...	44.74	...	−.16
20	27:14.20	...	...	1.92	
	...	...	46.66	...	+.06
25	28:00.86	95.30	...	1.98	
	* ...	...	48 64	...	+.22
30	28:49.50	...	...	2.10	
	...	...	50.74	...	+.12
35	29:40.24	103.70	...	2,22	
	* ...	...	52.96	...	−.26
40	30:33.20	...	...	1.96	
	...	...	54.92	...	+.10
45	31:28.12	111.90	...	2.06	
	* ...	...	56.98	...	+1.16
50	32:25.10	...	...	3.22	
	...	...	60.20	...	+2.28
55	33:26.30	126.90	...	5.50	
	* ...	...	65.70		
90.00	34:32.00				

TABLE II. Interpolations between Tabular refractions for Z.D. 89° *&* *Z.D.* 90°

Mean refrac-tion.	Tab. diff. M.R.	d. 1	d. 2	d. 3	New No. or − + original.
′ ″	″				
24:26.80					
...	...	39.2			
25:06.	80,1	...	1.7		
...	...	40.9	...	+.1	+0.03
25:46. 9	...	...	1.8		
—	...	42.7	...	+.1	+0.10
26:29. 6	87.3	...	1.9		
...	...	44.6	...	+.1	+0.14
27:14. 2	...	...	2.0		
...	...	46.6	...	+.0	+0.00
28:00. 8	95.2	...	2.0		
...	...	48.6	...	+.2	−0.06
28:49. 4	...	...	2.2		
...	...	50.8	...	+.1	−0.10
29:40. 2	103.9	...	2.3		
...	...	53.1	...	+.2	−0.14
30:33. 3	...	...	2.5		
...	...	55.6	...	+.1	+0.10
31:28. 9	113.8	...	2.6		
...	...	58.2	...	+.2	+0.78
32:27. 1	...	...	2.8		
...	...	61.	...	+.1	+0.20
33:28. 1	124.9	...	2.9		
* ...	...	63.9	...	...	+0.18
34:32.					

The numbers to which asterisks are affixed, are those of the original Table.

With a view to facilitate the computation of numbers still intermediate between those in the present Table, Log. differences corresponding to one minute of altitude and to one second of refraction, have been given in separate columns.

The Tables (II and III of 1838) containing the Log co-efficient for Barometric pressure and for temperature, have been extended by continuing the application of the tabular differences to the limits of practical utility, and the co-efficients of the correction for altitudes under 10° have been taken from their respective columns in the original Table I. and extended by interpolation as above.

The following examples, will explain the use of the Tables.

Let P. denote the height of the Barometer.

„ T. „ the temperature, Fahrenheit.

„ T. „ the Zenith distance of the object.

Then as far as 80° of Zenith distance the log mean refraction is equal to Log. P. From TABLE I.
+ Log. T. From TABLE II.
+ Log. Z. From TABLE III,
and to the refraction so found, must be applied the following corrections when the Zenith distance exceeds 80° vizt.

— T. (T. — 50°.)
— b. (30 in.— p.)

The values of T. and b. will be found in TABLE IV.

Example I. The observed Zenith distance of Capella being 80°, 24′, 09.″4.

The height of the Barometer 29.73 and the Temperature 47.°75. Fahrenheit required the refraction ?

Log. P.	29.73	Table, I.	9.99607
Log. T.	47.75	Table, II.	0.00214
Log. Z.	88°: 20′: 00	Table, III.	3.08087
Propl. part for 04′: 09″.4 = 04′.157.		.. ..	840
Nearest Tabular refraction,		.. .. 20′: 04″.68	3.08748

Log. diff. 661 ÷ 36 or Tab. diff. for 1″.= + 18.37
T. (T.—50°) (Table IV.)= —.92+—2.°25= + 2 32
b. (30 in. p.) (Table IV.)= —167 +,+.27= — 0.45

Mean refraction, ... 20′: 24″.92

Example II. From the appendix to the Greenwich Transactions for 1836.

To find the refraction for Zenith distance 83°. 22′, the Barometer reading being 29.63 and Thermometer 58°.1.

Log. P.	29.63	Table, I.	9.99461
Log. T.	58.°1	Table, II.	9 99239
Log. Z.	83° 20′	Table, III.	2.66759
Propl. part for	02′	,, ...	190
Nearest Tabular refraction,		.. .. 7′: 30″.21	2.65641

Log. diff. 308. ÷ 94 or Tab. diff. for 1.″ =,	+ 03.28
T. (T.—50°) Table IV,=, —.08 ×, + 8.1=,	—00,65
b. (30 in. p.) ,, — .14 ×, + .37=,	—00,05
Mean refraction by the tables, ..	7′: 32.″79
Ditto ditto by P. Bessel's Tables, appendix, Gr. Tr. 1836, ...	7′: 31.″71
Refraction by Ivory's Tables, ...	+ 1″.08

When the *altitude* of the body is observed it is advisable to convert it into Zenith distance by subtraction from 90°, the proportional parts of the Logs. being then additive.

Example III. The altitude of the sun's lower limb was observed 45°: 15′: 42″5, the Barometer standing at 23.33, and the Thermometer at 47.2° Fahrt. required the refraction.

(90° — 45°: 15.′ 42″.5) = 44°: 44′: 17″.5. = Z.

Log. P.	23.33	Table I.		9.89079
Log. T.	47°.2	Table II.		0.00266
Log. Z.	44°: 30′	Table III.		1.75855
Prop. part for	14′.292	do.		357
Nearest Tabular number, ...			0′: 44.″80	1.65557
Log. diff. 43 ÷ 96 or Tab. diff. for 1″=			+ 0.45	
Mean refraction, ...			0′: 45.″25	

The following errata in the Original Table (Phil. Trans. for 1838) have been corrected.

Mean Refraction for Z.D. 89°:50′ printed 32′:15″.10 should be 32′:25″.1

Log. diff. Z.D. 89°:00′ and 89°:10′	2316		2306
86°:40′ and 86°:50′	1627		1527
85°:40′ and 85°:50′	1312		1308
83°:00′ and 83°:10′	833		933

H.E.I.C. Magnetic Observatory, Simla, December, 1842.

FAHRENHEITS THERMOMETER.						BAROMETER.					
Temp.	Log. arithm.	Diff. 1 deg.	Temp.	Log. arithm.	Diff. 1 deg.	Height.	Log. arithm.	Diff. 0·1 Inch.	Height.	Log. arithm.	Diff. 0.1 Inch.
°			°			Ins.			Ins.		
10	0.03952	103	70	9.98240	91	32.0	0.02803	136	26.0	9 93785	167
11	0.03849	103	71	9.98049	91	31.9	0.02667	136	25.9	9.93618	168
12	0.03746	102	72	9.97958	91	.8	0.02531	137	.8	9.93450	169
13	0.03644	102	73	9.97867	90	.7	0.02394	137	.7	9.93281	169
14	0.03542	102	74	9.97777	91	.6	0 02257	138	.6	9 93112	170
15	0.03440	102	75	9.97686	90	.5	0 02119	138	.5	9 92942	171
16	0.03338	101	76	9 97596	90	.4	0.01981	139	.4	9.92771	171
17	0.03237	101	77	9.97509	90	.3	0.01842	139	.3	9.92600	172
18	0.03136	102	78	9.97416	90	.2	0.01703	139	.2	9.92428	173
19	0.03034	101	79	9.97326	89	.1	0.01564	140	.1	9.92255	173
20	0.02933	101	80	9.97237	89	31.0	0.01424	140	25.0	9.92082	174
21	0.02832	101	81	9.97148	90	30.9	0.01284	141	24.9	9.91908	174
22	0.02730	100	82	9 97058	89	.8	0.01143	141	.8	9.91733	175
23	0.02630	100	83	9.96969	89	.7	0.01002	142	.7	9.91558	176
24	0.02531	99	84	9.96880	89	.6	0.00860	142	.6	9.91381	176
25	0.02432	100	85	9.96791	88	.5	0.00718	143	.5	9.91204	177
26	0.02332	100	86	9 96703	88	.4	0.00575	143	.4	9.91037	178
27	0.02232	99	87	9.96615	88	.3	0.00432	144	.3	9.90849	180
28	0.02133	99	88	9 96527	87	.2	0.00289	144	.2	9.90669	180
29	0.02034	99	89	9.96440	88	.1	0.00145	145	.1	9.90489	181
30	0.01935	98	90	9.96352	87	30.0	0.00000	145	24.0	9.90308	181
31	0.01837	99	91	9.96265	88	29.9	9.99855	146	23.9	9.90127	181
32	0.01738	98	92	9.96177	88	.8	9.99709	146	.8	9.89946	183
33	0.01640	99	93	9.96089	87	.7	9.99563	146	.7	9.89763	184
34	0.01541	97	94	9.96002	88	.6	9.99417	147	.6	9.89579	184
35	0.01444	98	95	9.95914	87	.5	9.99270	147	.5	9.89395	186
36	0.01346	98	96	9·95827	87	.4	9 99123	148	.4	9.89209	186
37	0.01248	97	97	9.95740	87	.3	9.98975	149	.3	9.89023	186
38	0.01151	98	98	9·95953	86	.2	9.98826	149	.2	9.88837	188
39	0.01053	96	99	9.95567	87	.1	9.98677	249	.1	9.88649	189
40	0.00957	96	100	9.95480	86	29.0	9.98628	150	23.0	9.88460	189
41	0.00861	97	101	9.95394	87	28.9	9.98378	151	22.9	9.88271	190
42	0.00764	96	102	9 95307	86	.8	9.98227	151	.8	9.88081	191
43	0.00668	96	103	9.95220	86	.7	9.98076	152	.7	9.87890	191
44	0.00572	96	104	9.95135	85	.6	9.97924	152	.6	9.81699	193
45	0.00476	96	105	9.95050	85	.5	9.97772	152	.5	9.87506	193
46	0.00380	95	106	9.94965	85	.4	9.97620	153	.4	9.87313	195
47	0.00285	95	107	9.94880	86	.3	9.97467	154	.3	9.87118	196
48	0.00190	96	108	9.94794	85	.2	9.97313	154	.2	9.86923	197
49	0.00094	94	109	9.94709	84	.1	9.97159	155	.1	9.86727	197
50	0.00000	94	110	9.94625	85	28.0	9 97004	156	22.0	9.86530	198
51	9.99906	95	111	9.94540	85	27.9	9.96848	156	21 9	9.86332	198
52	9.99811	94	112	9.94455	84	.8	9.96692	156	.8	9.86134	200
53	9.99717	94	113	9 94371	84	.7	9.96536	157	.7	9.85934	201
54	9.99623	94	114	9.94287	84	.6	9.96379	158	.6	9.85733	201
55	9.99529	95	115	9.94203	84	.5	9.96221	158	.5	9.85532	203
56	9.99434	93	116	9.94119	84	.4	9.96063	159	.4	9.85329	203
57	9.99341	93	117	9.94035	84	.3	9.95904	159	.3	9.85126	205
58	9 99248	94	118	9.93951	83	.2	9 95745	160	.2	9 84921	205
59	9.99154	93	119	9.93868	83	.1	9.95585	161	.1	9 84716	206
60	9.99061	92	120	9.93785	84	27.0	9.95424	161	21.0	9.84510	207
61	9.98969	94	121	9.93701	83	26.9	9.95263	162	20.9	9.84303	209
62	9.98875	92	122	9.93618	83	.8	9.95101	162	.8	9.84094	209
63	9 98783	93	123	9.93535	83	.7	9.94939	163	.7	9.83885	210
64	9.98690	92	124	9 93452	82	.6	9.94776	163	.6	9.83675	212
65	9.98598	92	125	9.93370	82	.5	9.94612	164	.5	9.83463	212
66	9.98506	92	126	9 93288	82	.4	9.94448	164	.4	9.83251	214
67	9.98414	91	127	9 93205	82	.3	9.94283	165	.3	9.83037	214
98	9.98323	92	128	9.93120	82	.2	9.94118	166	.2	9.82883	216
69	9.98231	91	129	9.93041	83	.1	9.93952	167	.1	9.82607	216
70	9.98140		130	9.92958		26.0	9.93785		20 0	9.82391	

Alt.	Zen. dist.	Mean Refraction.	Log. Z.	Log. diff. for 1′ of ZD.	Log. diff. for 1″ of Refn.	Alt.	Zen. dist.	Mean. Refraction.	Log. Z.	Log. diff. for 1′ of ZD.	Log. diff. for 1″ of Refn.
° ′	° ′	′ ″				° ′	° ′	′ ″			
90.00	00.00	00.00.00	0.0000			46.00	44,00	00.56.35	1.75100		
89	01	01.02	0.0085			45.30	44.30	57.35	1.75855	25	755
88	02	02.04	0.3097	50	2953	45	45	58.36	1.76611	25	741
87	03	03.06	0 4860	29	1728	44.30	45.30	59.39	1.77367	25	734
86	04	04.08	0.6112	21	1227	44	46	01.00.43	1.78123	25	727
85	05	05.11	0.7086	16	955	43.30	46.30	01.49	1.78880	25	714
84	06	00.06.14	0.7882	12	773	43	47	02.57	1.79637	25	701
83	07	07.17	0.8557	11	656	42.30	47.30	03.67	1.80396	25	690
82	08	08.21	0.9144	10	570	42	48	01.04.80	1.81155	25	672
81	09	09.25	0.9663	9	500	45	48.15	05.37	1.81535	25	667
80	10	10.30	1.0129	8	448	30	30	05.94	1.81915	25	667
79	11	11.35	1.0553	7	404	15	45	06.52	1.82296	25	657
78	12	00.12.42	1.0941	7	366	41.00	49.00	01.07.11	1.82678	25	648
77	13	13.49	1.1300	6	356	45	15	07.70	1.82060	25	648
76	14	14.56	1.1634	6	309	30	30	08.30	1.83442	25	637
75	15	15.66	1.1947	5	287	15	45	08.91	1.83825	26	628
74	16	16 75	1.2241	5	267	40.00	50.00	01.09.52	1.84208	26	628
73	17	17.86	1.2519	5	250	45	15	10.13	1.84592	26	624
72	18	00.18.98	1.2784	4	237	30	30	10.75	1.84976	26	624
71	19	20.11	1.3036	4	233	15	45	11.38	1.85361	26	611
70	20	21.26	1.3277	4	210	39.00	51.00	01.12.02	1.85747	26	604
69	21	22.42	1.3507	4	199	45	15	12.66	1.86134	26	604
68	22	23.60	1.3729	4	188	30	30	13.31	1.86521	26	595
67	23	24.80	1.3944	4	179	15	45	13.97	1.86909	26	588
66	24	00.26.01	1.4151	3	171	38.00	52.00	01.14.64	1.87298	26	581
65	25	27.24	1.4352	3	163	45	15	15.31	1.87688	26	581
64	26	28.49	1.4547	3	156	30	30	15.99	1.88079	26	575
63	27	29.76	1.4736	3	149	15	45	16.68	1.88461	26	568
62	28	31.05	1.4921	3	143	37.00	53.00	01.17.38	1.88863	26	561
61.30	28.30	31.71	1.5012	3	135	45	15	18.08	1.89256	26	561
61	29	00.32.38	1.5102	3	134	30	30	18.80	1.89650	26	555
60.30	29.30	33.05	1.5191	3	133	15	45	19.51	1.90044	26	547
60	30	33.72	1.5279	3	131	36.00	54.00	01.20.24	1.90440	26	542
59 30	30.30	34.40	1.5366	3	128	45	15	20.98	1.90838	27	535
59	31	35.09	1.5452	3	125	30	30	21.73	1.91237	27	531
58.30	31.30	35.79	1,5537	3	121	15	45	22.48	1.91637	27	525
58	32	00.36.49	1.5632	3	121	35.00	55.00	01.23.25	1.92038	27	520
57.30	32.30	37·20	1.5706	3	118	45	15	24.03	1.92440	27	515
57	33	37.93	1.5790	3	117	30	30	24.81	1.92843	27	517
56.30	33.30	38.66	1.5873	3	114	15	45	25.60	1.93247	27	511
56	34	39.39	1.5955	3	112	34.00	56.00	01.26.41	1.93653	27	501
55.30	34 30	00.40.14	1.6036	3	108	45	15	27.22	1.94060	27	503
55	35	40.89	1.6116	3	107	30	30	28.04	1.94469	27	499
54.30	35.30	41.65	1.6196	3	105	15	45	28.38	1.94879	27	488
54	36	42.42	1.6276	3	104	33.00	57 00	01.29.73	1.95291	27	485
53.30	36.30	43.21	1.6356	3	100	45	15	30.59	1.95704	28	480
53	37	44.10	1.6435	3	100	30	30	31.46	1.96129	28	477
52·30	37.30	44.80	1.4513	3	99	15	45	32.34	1.96536	28	474
52	38	00.45.61	1.6591	3	96	32.00	58.00	01.33.22	1.96955	28	471
51.30	38.30	46.43	1.6668	3	95	45	15	34.14	1.97375	28	462
51	39	47.27	1.6746	3	93	30	30	35.06	1.97797	28	460
50.30	39.30	48.12	1.6823	3	91	15	45	35 99	1.98221	28	456
50	40	48.99	1.6901	3	89	31.00	59.00	01.36.93	1.98646	28	452
49.30	40.30	49.87	1.6978	3	88	45	15	37.89	1.99073	29	445
49	41	00.50.76	1.7055	3	87	30	30	38.86	1.99502	29	442
48.30	41.30	51.66	1.7131	3	86	15	45	39.85	1.99934	29	436
48	42	52.47	1.7204	3	84	30.00	60.00	01.40.85	2.00368	29	434
47.30	42.30	53.49	1.7283	3	83	45	15	41.86	2.00804	29	432
47	43	54.43	1.7358	3	81	30	30	42.89	2.01242	29	425
46.30	43.30	55.38	1.7434	3	80	15	45	43.94	2 01682	29	419
46	44	00.56.35	1.7510	3	78	29.00	61.00	01,45.01	2.02124	29	413

Alt.	Zen. dist.	Mean Refract.	Logarithm. Z.	Log. diff. for 1′ of Z. D.	Log. diff. for 1′ of Refn.	Alt.	Zen. dist.	Mean Refract.	Logarithm. Z.	Log. diff. for 1′ of ZD.	Log. diff. for 1″ of Refn.
° ′	° ′	′ ″				° ′	° ′	° ″			
29.00	61.00	1.45.01	2.02124			20.00	70.00	2.19.36	2.20185		
50	10	45.73	2.02420	30	412	55	05	39.87	2.20379	39	271
40	20	46.45	2.02717	30	411	50	10	40.59	2 20573	39	271
30	30	47.19	2.03015	30	404	45	15	41.31	2.20768	39	271
20	40	47.93	2.03315	30	404	40	20	42.04	2.20963	39	271
10	50	48.68	2.03616	30	401	35	25	42.78	2.21159	39	266
28.00	62.00	1.49.44	2.03918	30	398	30	30	2.43 52	2.21356	39	266
50	10	50.20	2.04221	30	398	25	35	44.26	2.21554	40	265
40	20	50.97	2 04526	31	396	20	40	45.01	2.21752	40	265
30	30	51.76	2.04832	31	387	15	45	45.77	2.21951	40	262
20	40	52.55	2.05138	31	387	10	50	46.53	2.22150	40	262
10	50	53.35	2.05446	31	385	05	55	47.30	2.22351	40	261
27.00	63.00	1.54 17	2.05755	31	377	19.00	71.00	2.48 08	2.22552	40	259
50	10	54.99	2.06065	31	377	55	05	48.86	2.22754	40	258
40	20	55 82	2 46377	31	377	50	10	49.65	2.22956	40	256
30	30	36.66	2.06690	31	374	45	15	50.45	2.23159	41	254
26	40	57.50	2.07004	31	373	40	20	51.25	2 23363	41	254
10	50	58.35	2.07319	32	371	35	25	52.06	2.23568	41	253
26.00	64.00	1.59.22	2.07635	32	363	30	30	2.52.87	2.23773	41	253
50	10	2.00.10	2.07954	32	363	25	35	53.70	2.23979	41	349
40	20	00.99	2.08274	32	360	20	40	54,53	2.24186	41	249
30	30	01.89	2.08595	32	357	15	45	55.37	2.24394	42	248
20	40	02.80	2.08918	32	355	10	50	56.21	2.24603	42	248
10	50	03.72	2.09242	32	352	05	55	57.06	2 24812	42	246
25.00	65.00	2.04.65	2.09567	33	350	18 00	72.00	2.57.92	2.25022	42	244
50	10	05.59	2.09894	33	348	55	05	58.79	2.25233	42	243
40	20	06.54	2.10223	33	346	50	10	59.66	2.25445	42	243
30	30	07.51	2.10553	33	340	45	15	3.00.54	2.25657	42	241
20	40	08.49	2.10885	33	339	40	20	01.43	2.25870	43	239
10	50	09.48	2.11219	33	337	35	25	02.33	2.26084	43	238
24.00	66.00	2.10.48	2.11555	34	336	30	30	3.03.23	2.26299	43	238
50	10	11.50	2.11892	34	330	25	35	04.14	2.26515	43	237
40	20	12.53	2.12230	34	328	20	40	05.06	2.26732	43	236
30	30	13.57	2.12570	34	427	15	45	05.99	2.26950	44	234
20	40	14.62	2 12912	34	326	10	50	06.93	2.27168	44	233
10	50	15.69	2.13256	34	322	05	55	07.87	2.27388	44	233
23.00	67.00	2.16.78	2.13602	35	317	17.00	73 00	3.08.83	2.27608	44	228
50	10	17.88	2.13950	35	316	55	05	09.80	2.27829	44	228
40	20	18.99	2.14300	35	315	50	10	10.77	2.28051	44	227
30	30	20.12	2.14652	35	312	45	15	11.75	2.28274	45	227
20	40	21,27	2.15006	35	308	40	20	12.74	2.28498	45	225
10	50	22 43	2.15362	36	307	35	25	13.74	2.28723	45	225
22.00	68.00	2.23.61	2.15720	36	303	30	30	3.14.75	2.28948	45	223
50	10	24.81	2.16080	36	300	25	35	15.77	2.29174	45	222
40	20	26.03	2·16442	36	297	20	40	16.80	2.29402	46	221
30	30	27.26	2.16806	36	296	15	45	17.83	2.29631	46	220
20	40	28.50	2.17172	37	395	10	50	18.88	2.29860	46	220
10	50	29.76	2.17540	37	292	05	55	19.94	2.30091	46	218
21.00	69.00	2.31.64	2 17911	37	290	16.00	74.00	3.21.01	2.30323	46	217
55	05	31.69	2,18097	37	287	55	05	22 09	2.30556	47	216
50	10	32.34	2.18284	37	287	50	10	93.18	2.30789	47	214
45	15	33.00	2.18471	38	384	45	15	24.28	2.31023	47	213
40	20	33.66	2.18659	38	284	40	20	25.39	2.31259	47	213
35	25	34.33	2.18847	38	981	35	25	26 52	2.31496	47	212
30	30	2.35.00	2.19036	38	281	30	30	3.27.65	2.31734	48	210
25	35	35.68	2.19226	38	279	25	35	28.79	2.31973	48	208
20	40	36.36	2.19416	38	279	20	40	29.95	2.32213	48	207
15	45	37.05	2.19607	38	277	15	45	31.12	2.32454	48	206
10	50	37.75	2.19794	38	275	10	50	32 30	2.32696	48	205
05	55	38.45	2.19992	39	275	05	55	33.49	2.33039	49	204
20·00	70.00	2.39.16	2.20185	39	272	15.00	75.00	3·34.70	2.33184	49	203

Alt.	Zen. dist.	Mean Refract.	Logarithm. Z.	Log. diff. for 1′ of Z. D.	Log. diff. for 1″ of Refn.	Alt.	Zen. dist.	Mean Refract.	Logarithm. Z.	Log diff. for 1′ of ZD.	Log diff. for 1″ of Refn.
° ′	° ′	′ ″				° ′	° ″	′ ″			
15.00	75.00	3 34.70	2 33104			10.00	80.00	5.20.19	2.50541		
55	05	35.92	2.33430	49	202	55	05	22.76	2.50887	69	135
50	10	37.15	2.33677	49	201	50	10	25.36	2.51237	70	134
45	15	38.39	2.33925	50	200	45	15	28.01	2.51589	70	133
40	20	39.65	2.34174	50	197	40	20	30.70	2.51943	71	132
35	25	40.93	2.34424	50	197	35	25	33.43	2.52300	71	13.
30	30	3.42.21	2.34676	50	196	30	30	5.36.20	2.52660	72	131
25	35	43.52	2.34929	51	196	25	35	39.02	2.53020	72	128
20	40	44.82	2.35183	51	195	20	40	41.88	2.03387	73	128
15	45	46.14	2.35438	51	193	15	45	44.19	2.53755	74	127
10	50	47.48	2.35695	51	192	10	50	47.74	2.54125	74	125
05	55	48.84	2.35953	52	190	05	55	50.74	2.54498	75	124
14.00	76 00	3.50.21	2.26212	52	129	09 00	81.00	5 53.79	2.54874	75	123
55	05	51.60	2 36473	52	188	55	05	56.89	2.55253	76	122
50	10	53 00	2.36735	52	187	50	10	6 00.04	2.55635	76	121
45	15	54.42	2 36998	53	185	45	15	03.24	2.56019	77	120
40	20	55.85	2 37263	53	185	40	20	06.50	2.56409	78	119
35	25	57·30	2 375.9	53	183	35	25	09.81	2.56798	78	118
30	30	3.58.76	2.37796	53	183	30	30	6.13.18	2.57192	79	117
25	35	4.00.24	2.38064	54	181	25	35	16.61	2.57589	79	116
20	40	01.74	2.38334	54	180	20	40	20,09	2.57989	80	115
15	45	03.26	2.38606	54	179	15	45	23.64	2.58393	81	114
10	50	04.79	2.38879	55	178	10	50	27.26	2·58800	81	112
05	55	06.34	2.39154	55	177	05	55	30.94	2·59210	82	111
13.00	77.00	4.07.91	2.39430	55	176	08.00	82.00	6.34.68	2.59624	83	111
55	05	09.50	2.39708	56	175	55	05	38.49	2.60041	83	109
50	10	11.11	2.39987	56	173	50	10	42.37	2.60462	84	109
45	15	12.74	2.40268	56	172	45	15	46.31	9.60886	85	108
40	20	14.39	2.40550	56	171	40	20	50.33	2.61313	85	106
35	25	16 06	2.40834	57	171	35	25	54.42	2.61774	86	105
30	30	4.17.75	2.41119	57	169	30	30	6 58.59	2.62179	87	104
25	35	19.46	2.41406	57	168	25	35	7.02.85	2.62618	88	103
20	40	21.19	2.41695	58	167	20	40	07.19	2.63062	89	102
15	45	22.95	2.41986	58	165	15	45	11.62	2.63509	89	101
10	50	24 72	2.42278	58	165	10	50	16.13	2.63961	90	100
05	55	26 51	2.42572	59	164	05	55	20.73	2.64417	91	99
12.00	78.00	4.28.33	2.42867	59	162	07.00	83.00	7.25.42	2.64877	92	98
55	05	30,17	2.43164	59	161	55	05	30.21	2,65341	93	97
50	10	32.04	2 43464	60	160	50	10	35.09	2.65809	94	96
45	15	33.93	2.43764	60	159	45	15	40.07	2.66282	95	95
40	20	35.84	2 44066	60	158	40	20	45.15	2.66759	95	94
35	25	37.78	2 44370	61	157	35	25	50.34	2 67241	96	93
30	30	4.39.75	2.44677	61	156	30	30	7.55.64	2.67727	97	92
25	35	41.74	2.44985	62	155	25	35	8.01.04	2.68218	98	91
20	40	43.76	2 45295	62	153	20	40	06.55	2.68713	99	90
15	45	45.81	2.45608	63	153	15	45	12.19	2.69213	100	89
10	50	47.89	2.45902	63	151	10	50	17.95	2.69718	101	88
05	55	49 99	2.46238	63	151	05	55	23.84	2.70229	102	87
11.00	79.00	4 52.12	2.46556	64	149	06.00	84.00	8.29.86	2.70746	103	86
55	05	54.28	2.46876	64	148	55	05	36.02	2.71267	104	85
50	10	56 47	2.47198	64	147	50	10	42.31	2.71793	105	84
45	15	58.69	2.47552	65	146	45	15	48,75	2.72225	106	83
40	20	5.00.94	2.47848	65	145	40	20	55.33	2,72862	107	81
35	25	03.22	2.48176	66	144	35	25	9 02.04	2.73405	109	81
30	30	05.54	2.48507	66	143	30	30	08.96	2.73954	110	79
25	35	07.89	2.48840	67	142	25	35	16.03	2.74509	111	79
20	40	10.28	2.49175	67	140	20	40	23.25	2.75070	112	78
15	45	12.70	2.49513	68	140	15	45	30.65	2.75637	113	77
10	50	15.66	2.49853	68	138	10	50	38.23	2.76210	115	76
05	55	17.66	2.50196	69	137	05	55	46.00	2.76970	116	75
10.00	80.00	5.20.19	2.50541	69	136	05.30	85.00	9,53.96	2.77376	117	74

Alt.	Zen. dist.	Mean. Refract.	Logarithm. Z.	Log. diff. for 1′ of Z. D.	Log. diff. for 1″ of Refn.
° ′	° ′	′ ″			
05.00	85.00	9.53 96	2.77376		
55	05	10.02.13	2.77969	119	73
50	10	10.52	2.78569	120	72
45	15	19.11	2.79176	121	71
40	20	27.90	2.79789	123	70
35	25	36.93	2.80409	124	69
30	30	46.21	2.81037	126	68
25	35	10.55.75	2.81673	127	67
20	40	11.05.55	2.82316	128	66
15	45	15.60	2.82967	130	65
10	50	25.90	2.83626	132	64
05	55	36.31	2.84293	133	63
04.00	86.00	11.47.43	2.84968	136	62
55	05	58.66	2.85652	137	61
50	10	12.10.21	2 86345	139	60
45	15	22.10	2.87046	140	59
40	20	34.34	2.87757	142	58
35	25	46.94	2.88476	144	57
30	30	12.59 92	2.89205	146	56
25	35	13.13.31	2.89944	148	55
20	40	27.11	2.90693	150	54
15	45	41·34	2.91462	152	53
10	50	55.99	2.92220	154	52
05	55	14.11.13	2.92999	156	51
03.00	87.00	26.76	2.93790	158	51
55	05	42.90	2.94591	160	50
50	10	59.54	2.95402	162	49
45	15	15.16.75	2.96225	165	48
40	20	34.55	2.97060	167	47
35	25	52.93	2.97906	169	46
30	30	16.11.95	2 98764	172	45
25	35	31.64	2.99635	174	44
20	40	52 03	3.00519	177	43
15	45	17.13.16	3.01417	180	43
10	50	35.06	3.02329	182	42
05	55	57.77	3.03254	185	41
02.00	88 00	18.21.33	3.04192	188	40
55	05	18.45,76	3.05144	190	39
50	10	19.11.07	3.06110	193	38
45	15	19.37,35	3.07091	196	37
40	20	20.04.68	3.08087	200	36
35	25	20.33.09	3.09099	202	36
30	30	21.02.60	3.10127	206	35
25	35	21.33.28	3.11170	209	34
20	40	22.05.22	3.12229	212	33
15	45	22.38.47	3.13305	215	32
10	50	23.13.11	3.14398	219	32
05	55	23 49.2	3.15509	222	31
01.00	89.00	24.26.8	3.16637	226	30
55	05	25.06	3.17783	229	29
50	10	25.46.9	3.18947	233	28
45	15	26.29 6	3.20130	237	27
40	20	27.14.2	3.21331	240	27
35	25	28.00.8	3.22551	244	26
30	30	28.49.4	3.23789	248	25
25	35	29.40 2	3.25046	251	25
20	40	30.33.3	3.26323	255	24
15	45	31.28.9	3.27620	259	23
10	50	32.27.1	3.28938	264	23
05	55	33.28.1	3.30278	268	22
00.00	90.00	34.32	3.31639	272	21

Alt.	Zen. dist.	Thermometer T.	Thermometer diff.for 1′Z.D.	Barometer. B.	Barometer. diff.for 1′Z.D.
° ′	° ″				
10.00	80.00	.03			
09.00	81.00	.04		.04	
08.00	82.00	.05		.05	
30	82.30	.06		.08	
07.00	83.00	.07	.001	.10	
45	83.15	.08		.11	.001
30	30	.09		.12	
15	45	.09		.14	
06.00	84.00	.10		.15	
45	15	.11		.16	.002
30	30	.12		.18	
0.15	45	.13		.20	
05.00	85.00	.15	.002	.22	
50	10	.17		.24	.003
40	20	.18		.27	
30	30	.20		.29	
30	40	.21		.32	
20	50	.23	.002	.34	
04.00	86.00	.24	.003	.37	.004
50	10	.26		.39	
40	20	.29		.43	
30	30	.31		.47	
20	40	.34		.51	.005
10	50	.36		.57	
03.00	87.00	.39	.004	.62	
55	05	.41		.67	.008
50	10	.43		.71	
45	15	.45		.75	
40	20	.47	.005	.79	
35	25	.50		.83	
30	30	.52		.87	
25	35	.55		.91	.010
20	40	.58		.96	
15	45	.61		1.01	.012
10	50	.63	.006	1.07	
05	55	.66		1.13	
02 00	88.00	.69		1.19	
55	05	.74	.009	1.24	.017
50	10	.78		1.32	
45	15	.83		1.41	
40	20	.87		1.50	
35	25	.92		1.58	
30	30	.96	.011	1.67	
25	35	1.02		1.75	.025
20	40	1.07	.012	1.87	
15	45	1.13		2.00	
10	50	1.19	.013	2.12	
05	55	1.26		2.24	
01.00	89.00	1.32	.028	2.36	
55	05	1.42		2.48	.043
50	10	1.52		2.70	
45	15	1.62		2.91	
40	20	1.72		3.13	
35	25	1.82		3.34	
30	30	1.92		3.56	.058
25	35	2.06		3.77	
20	40	2.20		4.05	
15	45	2 34		4.34	.067
10	50	2.48	.026	4.67	
05	55			5.00	
00.00	90.00				

AN ELEVENTH *Memoir on the Law of Storms in India, being the Stroms in the Bay of Bengal and Southern Indian Ocean, from 26th November to 2d December*, 1843. *By* HENRY PIDDINGTON; *with a Chart.*

In this memoir, for much of the material of which I am as usual indebted to the zealous exertions of Capt. Biden, Master Attendant of Madras, we have the advantage of tracing at the same time storms raging on the North and South sides of the Equator, of having a register of the weather almost *upon* the Equator while the storms were blowing on both sides, and finally of tracing with abundant data in the dangerous "Storm track" (as I have called it in another publication,)* extending from 5° to 15′ South and from 75° to 90′ E. a most severe hurricane, and this investigation has moreover developed a new feature in these storms, viz. that there are some which are comparatively *stationary!* having but an exceedingly slow progressive motion; and should this be found by future research to prevail frequently, it will be of importance both in our theoretical and practical views of storms. It will be found in the postcript to the Memoir that after this was sent to the press I obtained from the Mauritius, the details of a storm there, in which a vessel, the Charles Heddle, was fully proving for us by what I may call a beautiful experiment, the truth of our researches here!

I have as usual first given the documents carefully abridged, then a Tabular view of them for each hemisphere, a summary of the grounds from which the positions of the centres of the storms on different days are developed, and finally a few remarks on the whole.

Copy of Report kept at the Master Attendant's Office Madras, from Captain BIDEN.

	Barometer.		
	8 A. M.	4 P. M.	10 P. M.
30*th November* 1843.—6 A. M. North West wind, North current strong and high surf. 7 A. M. North West wind, current very strong, high, and irregular surf, ..	30.012	29.925	29.997
1*st December* 1843.—6. A. M. North West wind, North current, strong, high and irregular surf no boats or Cattamarans could cross the surf. Rain, ...	29.984	29.877	29.953

* Horn Book of Storms p.——.

	Barometer.		
	8 A. M.	4 P. M.	10 P. M.
2d December 1843.—6 A. M. North West wind, North current, strong irregular and high surf, cloudy, ...	29.944	29.861	29.916
Ditto.—5-30, P. M. North wind, North current, strong and very high surf, no boats or Cattamarans could cross the surf. Raining, ...			
3d December 1843.—4-55, A. M. North East wind, North current and high surf; cloudy weather, ...	29.956	29.893	29.986
Ditto.—3-15, P. M. South East wind, South current, high surf and rain,..			
Ditto.—6 P. M. South East wind, South current and rain,			
4th December 1843.—5 A. M. East wind, South current, high and irregular surf; drizzling rain, ...	30.008	29.912	29.988
Ditto.—10-30, A. M. East wind, South current strong, and moderate surf, ...			

(Signed) CHARLES BIDEN.

Abridged Log of the Ship VERNON, *Captain* J. GIMBLETT, *from Madras to Calcutta, reduced to civil time.*

The Vernon left Madras roads, on the 30th November 1843, at 7. P. M. and stood to the East, with a fresh monsoon from N.N.E. till midnight.

1*st December.*—A. M. strong breeze N. N. E. till noon when Lat. 12° 5′ N., Long. Chro. 83° 29′, E., Bar. 29.68., Symp. 29.52:, P. M. fresh gales to midnight with the wind veering at 9 P. M. to N. E. and at midnight to E.N.E.

2*d December.*—A. M. heavy squalls; at 2 wind *shifted* to E. S. E. with confused sea and much lightning, Bar. 29 54. 9 A. M. wind E. by S. moderating a little; noon squally and heavy sea Lat. D. R. 11° 48′ N. Long. D. R. 83° 38′, Bar. 29.69., Symp. 29.54. Ther. 81° P. M. strong gale Easterly, moderating to fine, at 7 P. M. when wind at E. N. E.

Tabular Memorandum of the state of the Weather as observed during a Passage from Calcutta towards the Mauritius with latitude and longitude, state of the Thermometer, both air and water every day at Noon, Moon's age &c. Together with the force and Direction of the Winds and state of the Weather, immediately preceding as well as during and after the various gales. By Capt. WEBB, *Ship* WINIFRED.

Part of the world.	Date in nautical time.	Hour.	Latitude & Longitude at Noon.		Moon's age.	Height of Bar.		Ther. air	Ther. water.	Explanatory and General Remarks.	
	1843.		° ′	° ′							
Bay of Bengal, ...	Nov. 24th,	Noon, ...	15 27 N.	87 10 E.	...	29	83	78	79	N. E. steady.	Fine clear weather and smooth water.
		8 P. M....	.....	.....	...	...	83				
		4 A.M....	.....	.....	...	...	83				
	Nov. 25th,	Noon, ...	12 43 N.	86 23 E.	...	29	82	78½	78	N. E. } Strong threat-	Fresh breezes and cloudy weather.
		8 P. M....	.....	.....	...	...	81	...	...	N. N. E. } ning clouds	
		4 A.M....	.....	.....	...	...	81	...	...	Vble. to } and gloomy	
	Nov. 26th,	Noon, ...	9 40 N.	85 48 E.	...	...	80	78	78	East. } appearance.	From 4 A.M. to noon. Dark gloomy and wild appearance.
		8 P.M....	.....	.....	...	...	76	...	...	N. N. E. Squally.	At 9 P. M. strong squalls and heavy rain, took in and made sail accordingly; passed the ship Hooghly of London.
		4 A.M....	.....	.....	...	...	72	...	...	East and Vble. and squally.	
	Nov. 27th,	Noon, ...	7 4 N.	85 56 E.	...	...	67	78	78½	E. N. E. Strong squalls. ...	Sudden dangerous gusts and violent squalls, with very little warning from their first appearance above the horizon; heavy rain attending the squalls.
		8 P M....	.....	.....	...	...	67	...	...	North and thick gloomy Wr.	
		4 A.M....	.....	.....	...	...	58	...	...	N. N. W. [heavy rain.	
Indian Ocean, ...	Nov. 28th,	Noon, ...	4 27 N.	85 58 E.	...	...	65	79	78½	N. W. Throughout.	Strong gales, short confused sea, ship labouring much; at 11 P. M. most terrific squalls accompanied with torrents of rain, dark dismal weather, reduced sail to double reef top-sail.
	,,	8 P. M....	.....	.....	...	...	60	...	...	N. N. W. Contin. throughout of heavy rain the 24 hours and gloomy weather.	
	,,	4 A.M....	.....	.....	...	29	57				
	Nov. 29th,	Noon, ...	1 20 N.	86 30 E.	...	...	59	81	81	... ...	Succession of dangerous squalls and thick weather.
		8 P. M....	.....	.....	...	...	66	...	...	N. N. W. { violent squalls varying to dark gloomy dismal weather.	Observed the most severe squalls these last three days to commence with drizzling small rain after which (generally) follows torrents of rain, accompanied with most violent and terrific squalls. A ship must be well prepared to meet them, to save the canvas and spars from destruction; Barometer rising and falling during the squalls and rain, so that no dependence could be placed upon it, varying at times in an hour, from 29.74, to 29.57, &c.
South Lat....	Nov. 30th,	4 A.M....	.....	.....	...	...	65				
		Noon, ...	1 1 S.	86 0 E.	...	...	64	83	83½	W. and	
		8 P. M....	.....	.....	...	...	68	...	...	West { violent varying	
		4 A.M....	.....	.....	...	...	74				
	Dec. 1st,...	Noon, ...	3 15 S.	86 56 E.	...	...	67	82	82½	N. W. { squalls as before stated moderating.	
		8 P.M....	.....	.....	...	...	68	...	...	N. W.	
		4 A.M....	.....	.....	...	...	68	...	...	Calm and promising.	
	Dec. 2d. ...	Noon, ...	4 21 S.	87 34 E.	...	...	74	83	83	Calm weather.	

Report of the Barque NIAGARA *Capt.* W. CHAMPION, *forwarded by Captain* BIDEN.

Friday 1*st December* 1843.—Lat. 10° N., Long. 87° E., experienced a hard gale from S. W. to E. S. E. with a tremendous high sea on; lost sails and sustained other damage, strong gales from Eastward on Saturday the 2d. On approaching the coast, found the weather more moderate and a smoother sea; during the above days it rained incessantly, and the Bar. fell to 29.10, Ther. 78° 40′.

Abridged Log of the Ship CANDAHAR, *Capt.* W. RIDLEY, *from the Mauritius bound to Calcutta; reduced to civil time.*

26*th Nov.* 1842.—Wind variable from N. N. E., N. b. E., and N. E. b. N., Course North 54° W. 94′, Lat. account 8° 19′ N., Long. 84° 38′ E., heavy squalls Bar. 29.80.

27*th November.*—To noon cloudy, wind N. E., strong wind till midnight when N. E. b. E., Lat. noon 9° 5′ N., Long. 83° 50′, Sunset heavy squalls, Bar. not marked.

28*th November.*—Strong Monsoon N. E. b. E. 2 A. M. veering to Northward 11 A. M. Violent squall; noon heavy weather, Lat. account 9° 15′ N., Long. E. 83° 45′, heavy squalls and strong monsoon till midnight. Bar. 29.70.

29*th November.*—Heavy breeze N. b. E. with squalls, noon every appearance of a storm, Lat. 9° 26′ N., Long. 83° 48′ E. 4 P. M. rapidly increasing. At 6 wind North; laid to, heavy squalls and rain, Bar. 29.7.

30*th November.*—Heavy gales, and tremendous squalls. Wind 1 A. M. N. W. by N. Lat. 9° 40′, North, Long. 83° 57′ E. 11 A. M. terrific squall of wind and rain. Bar. 29.50. P. M. heavy gale N. W. to midnight.

1*st December.*—A. M. heavy gale N. W. with terrific squalls. At 2 A. M. wind N. b. E. 8 A. M. N. W. b. W. Noon, to 3 P. M. very little wind, Lat. 10° 32′ North, Long. 84° 3′ E. At 3 P. M. wind *shifted* to S. W., Bar. fell to 29.40., 5 P. M. shifted again to N. W., 9 P. M. set fore-sail; at 10 wind veered again to S. W., midnight, gale appearing steady, shook out close reefs, steering North.

N. B.—From 11 A. M. to midnight steering North 4′ per hour. At 11 and 12, 4½ per hour.

2nd December.—1 A. M. gale suddenly increased to a most violent storm S. W., hove to under try-sails; 4 A. M. South. 5 to 6 raging with increased fury, Bar. 29.40, 8 A. M. more moderate, bore up steering North 6 miles. At 10 wind South. Noon Lat. account 11° 10′ North, Long. 84° 04′ E., Bar. A. M. 29.60, 2 P. M, steering N. N. W. wind S. S. E. at 4 N. W. by N. wind S. E. 11 P. M. passed a ship, steering to the S. W. midnight. Bar. 29.80.

3rd December.—A. M. Strong breeze S. E. day-light steady, noon Lat. Obs. 12° 31′, Long. 84° 7′, fine weather.

Abridged Log of the Ship FAZZULBARRY, *Capt.* H. HANDLEY *from Bombay bound to Calcutta, reduced to civil time.*

27th November. 1843.—At noon moderate breeze from E. S. E. but threatening looking weather to the Eastward. Lat. 5° 38′ N., Long. Chr. 88° 40′, Bar. 29.72, and falling, Ther. 82°. For the last two days, current 110 miles to the Westward. Remark by Capt. Handley, at the beginning of this log. "Observed many thick white clouds densely packed to the Eastward which I have always found to precede an Easterly gale."

P. M. Strong breezes Easterly (and at 8 P. M. E. N. E.) dark cloudy weather and very threatening appearance to the Eastward with heavy N. E. sea on, increasing to a strong gale with dark threatening weather and heavy sea; Bar. 29.65.

28th November.—6 A. M. Wind N. E. Noon strong gale with dark threatening weather to the N. E. making all preparation for a gale. Lat. 7° 22′ N., Long. Chro. 88.10., Bar. 29.54, Ther. 81.0. P. M. Wind E. N. E. heavy gale with thick dark weather. 3h.30 P. M. saw the "John Brightman," steering to the Southward. Midnight gale increasing, Bar. 29.45.

29th November.—A. M. gale blowing most furiously, saw a ship running to the Southward. 10 wind N. E. b. E. marked at noon N. E. Bar. 29.14, Ther. 83° No observation, Long. 87° 20′. P. M. furious gale N. N. E. Bar. 29.40. At 11.30 ship in distress and Arab crew

alarmed. Wind at North, bore up at midnight running S. E. and at 3 A. M. on 30th. S. S. E.

30th November.—Running to the S. S. E. 6½ knots. 3 A. M. gale at the greatest fury "blowing so hard that it was scarcely possible to hold on;" at 8, a little more moderate; noon moderating fast, but Barometer running low 29.40, Ther. 82°, Lat. indifferent Obs. 7° 22′ N., Long. 87° 35′ E., having since midnight made 74 miles to the S. S. E. and South. 8 P. M. wind N. N. E., course S. E. 5′ per hour; winds marked as variable N. N. E. to S. W. at 7 P. M. when (from 5 P. M. ship had only been going 1.4 knots) remarks are "variable dark cloudy weather and a high cross sea; easterly gale broken, but Barometer very low, 29.31. At 7 P. M. "a heavy Westerly sea rolling up and overpowering the Easterly sea" run from Noon to 8 P. M. S. E. 32 miles: a brig in sight. At 8 P. M. dark gloomy weather with packed masses of clouds to the S. W., vivid lightning. Vessel steering N. E. 23 miles, from 8 to midnight, when a strong breeze from the S. W. and the S. Westerly sea very high, dark threatening weather, vessel running 8 knots to the N. E.

1st December.—A. M. Increasing gale; at 4 A. M. violent and severe gale S. S. W. if possible worse than before. 7, tremendous S. S. W. gale, Bar. 29.30 to 9 A. M. when Bar. on the rise; at 10 A. M. Bar. 29. 45 gale moderating; at 11, 29.55 strong gales from South; Lat. indifferent obs. 9° 55′ N. Long. 88° 00′ E., Bar. 29.65., Ther. 82., P. M. Wind S. S. W., course N. E. 9½ knots, and run 107 miles; to midnight strong gale; 3 P. M. Bar. 29.75. 10 P. M. 29.80. Wind South, midnight moderating and sky clearing.

2d December.—Midnight to noon N. E. 51½ miles N. E. b. N. 49½ miles. A. M. Wind S. S. E. 6 A. M. S. E. 11 A. M. E. S. E. At noon fine weather; Lat. 11° 17′ N., Long. 89° 45′, Bar. 29.90, Ther. 83°.

Madras. The Colonel Burney.

The barque *Colonel Burney*, from Moulmein to Bombay passed by Galle on the 10th instant, under jury masts, having lost her main and mizen masts in a heavy gale on the 1st, in Lat. 6° 50′ N., Long. 85° 20′ E.—*Record, Dec.* 30.

Extract of a letter from Capt. Durham, *of the Barque* Col. Burney *to his owners dated, 28th December,* 1843.

Messrs. Apcar and Co.

Dear Sirs,—I beg to report the arrival of the Col. Burney here yesterday, after a passage of 33 days from Rangoon. I have lost main and mizen-masts by the deck during a heavy gale in Lat. 6° N., Long. 85° E., the vessel was thrown on her beam-ends; to save ship and cargo I cut away my masts, when she righted with 7 feet water in the hold.

Your obedient servant,

(Signed,) R. B. Durham.

Report from Kayts, *Ceylon, forwarded by Capt.* Biden.

My Dear Captain Biden.—You will no doubt have heard of the gale we have lately experienced down here; and as it was evidently one of the rotatory description I send you an account of it, supposing that any information on this subject will be interesting. It appears to have travelled in a W. S. Westerly direction, the Southern portion of the circle passing over Kayts, Delft island and Paumbum: At Manar, although the weather had a wild appearance, it was not felt at all. I was myself at Paumbum at the time, where I noted the changes closely; but at the other places, the variations may not be so correct: still they are sufficiently so to trace the track of the gale. To begin then with my windward station, Kayts.

It commenced here from the N. W. about noon on the 1st; increasing in violence till 6 p. m. of the 2d, between which and midnight it blew with great fury, accompanied by a very heavy fall of rain. On the morning of the 3d it shifted to W. S. W. strong, and by noon moderated at South.

At Delft island on the 1st the wind which had been moderate all day at N. W. freshened towards evening from the same quarter, and gradually veered round to between W. N. W. and W. by S; at which by 6 a m. on the 2d it was blowing a heavy gale. This continued all that day and night till 11.30 a. m. on the 3d when the wind suddenly

chopped round to S. by W. and moderated by daylight; next morning the wind was from S. S. E. and eventually settled at S. E.

At Paumbum.

1*st* A. M. Wind fresh at N. W.

P. M. More moderate at N. E.; freshening during the night but fine.

2*d*. A. M. 6 Moderate N. N. W. very cloudy.

10 Freshening and veering to the Westward; Ther 72°; lower than it has ever been before during the last 4 years; noon very fresh at N. W. with confused appearance, scud flying fast and low from North, 3 P. M. fresh, W. by S.

6. Ditto W. S. W. Scud still flying from North, but not so fast; heavy bank of rain to N. E. but without any appearance of wind from that quarter.

9. Increasing at W. S. W. Midnight, hard gales at W. S. W. with very heavy rain.

3*d*. A. M. 6, Sky a perfect lead colour, gale and rain continuing from same quarter till 3 A.M. when it moderated and P.M. veered to S. S. W. and South; scud now flying to N. E.

6. Strong breezes from S. W. to S. S. E. the wind not remaining steady for two consecutive minutes, still thick and hazy with rain.

4*th* A. M. Fresh South to S. S. E. and hazy.

You will find it easy with these dates to trace the progress of the whirlwind from Kayts to Paumbum, and if it continue in the same course it must coast along the shore of Madura and part of Tinnevelly, going to sea again from the Malabar coast at a little to the North of Cape Comorin; leaving Colombo untouched; a matter to be rejoiced at, as the craft there at this fine season would hardly have been prepared for a blow from any point South of West.

My vessel had a very narrow escape, having parted and drifted to within 80 yards of a reef. She lost bowsprit, rudder and boats, had her stern stove in and was otherwise much injured; but fortunately the wind coming round enabled her to get a start off and run round to leeward of the island where I picked her up a sad plight. We are repairing her now and I hope to be at sea again by the end of the week.

(Signed) J. J. Franklin.

Barque CARENA *from Ceylon towards Madras, reduced to Civil time.*

A long detailed extract of this vessel's log was kindly sent me by Capt. Biden, and it would have been highly interesting from her position between 5° and 13° North Lat., had any Long. accompanied it, but unfortunately there was none. And we are thus reduced to the necessity of saying only that she had,

On the 25*th November.*—Winds E. to N. W. in Lat. at Noon 4° 58′ N.

26*th November.*—Winds Northerly in 5° 43′ N., strong breezes and cloudy.

27*th November.*—Bar. 28.80., (by Capt. Biden's correction, 29.50.,) No observations, winds apparently N. E. to N. N. E.

28*th November.*—Wind N. E. by E. to N. N. W. No observations, weather hazy and much rain.

29*th November.*—N. W. to N. N. E. and again W. N. W.; light winds, cloudy and squally.

30*th November.*—N. N. W. Westerly and S. S. W. winds. Lat. 6° 57′ North.

1*st December.*—Lat. 9° 51′ N. winds Southerly increasing at 4 P. M. to a strong gale obliging the vessel to scud under a reefed fore-sail.

2*d. December.*—Moderating, Lat. 12° 17′ N. P. M. S. E. wind.

Abridged Log of the Brig BITTERN, *Captain* G. SCOTT, *from the Mauritius to Madras, forwarded by Capt.* BIDEN.*

28*th November* 1843.—1 P. M. Wind W. S. W. fresh breeze and cloudy; 7, Bar. 29.50; at 10 P. M., hard squalls.

29*th November.*—11 wind S. W. first part strong breezes, middle and latter parts fresh gale, with squally weather and rain. 9 A. M. Bar. 29.35. Noon, fresh gale and cloudy, Lat. Obs. 5° 33′ N.

1 P. M. wind S. W. fresh gale and squally; at 4 Bar. 29.24; at 3 wind S. S. W.; at 5 South more moderate but threatening in appearance, made preparation for bad weather; 10 wind S.S.E., 12 squally with small rain.

* With this log also no Longitudes are given.

30th November.—At 3 A. M. wind East; at 5, wind E. N. E. squally; at 7 Bar. 29.34; noon, fresh gale and cloudy, Lat. Obs. 8° 23′ N.

1 P M. wind E. N. E. fresh gale and cloudy, at 3 wind N. E. by E. at 5 Bar. 29.30, 8 Bar. 29.40. Hard squalls with small rain; 11 wind E. N. E. fresh gale throughout with frequent hard squalls and small rain; under storm trysails.

1st December.—3 A. M. furled the fore topsail, 5 Bar. 29.30, 7 more moderate, 10 wind East, Bar. 29.24. Noon, fresh gale and cloudy, Lat. Obs. 9° 49′ N.

1 P. M. wind S. E. fresh gale with hard squalls, 5 wind South, 8 hard squalls with small rain, 6 Bar. 29.35, fresh gale throughout with frequent hard squalls and small rain. Midnight Bar. 29.49.

2d December.—2 A. M., wind S. S. E. very hard squalls with small rain, 4 Bar. 29.60, 5 more moderate, 11 wind S. E., noon more moderate, Bar. 29.60. Lat. Obs. 11° 21′ N. after which fine weather.

Report from the Barque MARY IMRIC, *Captain* BOYD, *forwarded by Captain* BIDEN.

30th November, 1843.—Blowing a strong breeze from N. N. E. all possible sail set, daylight the weather became very cloudy, heavy dark masses rising in the North and passing over with increasing velocity to the Southward. Noon, weather dismally dark, with a very suspicious appearance, sun obscured, Lat. by account 12° 20′ North, P. M., the sea rising and the breeze increasing fast, took in all small sails and sent down royal and top-gallant yards, and close reefed the topsails, indeed at this time I would have been induced to lay the vessel to, the appearance of the weather was so bad; as well as being under the impression, that the farther you run into a storm the more likely you are to suffer from its effects* had the Barometer not kept well up; at daylight it stood at, .. 30 03

At noon it rose to, ... 30 11

2 P. M. down to, ... 29 83

where it continued till midnight, at which time it blew a terrific gale with a heavy cross sea, wind steady at N. N. E. and scudding under

* This is the old axiom. It depends of course on which side of a storm circle the ship is, to be correct. A ship should certainly never *run into* a storm, but she may as certainly often *run out of it*.—H. P.

two close reefed top-sails; I may here add that I never saw the mercury fluctuate so much, although it never fell lower than 29. 60.*

1*st December.*—From midnight till daylight, the gale continued with unabated force, with frequent hard squalls and heavy rain, and a dreadful sea running, that washed away nearly all the bulwarks, and drowned nearly the whole of the live stock. The sea was uncommonly cross, and evidently produced from other causes, besides the gale we were then in, and had we not taken the precaution to get every thing well secured on deck, as well as made secure aloft, the consequences might have been serious; towards noon the weather cleared away so far as to enable me to measure the sun's altitude, which placed us in 10° 4′ N. Long. 84° 1′ E. P. M. the gale continued with very unsettled weather, wind veering round to the Westward, Bar. 29.60; towards midnight weather tolerably clear overhead, but a dense wild looking haze all round the horizon, Bar. 29.25.

2*nd December.*—The wind continued to veer to the Westward till 2 A. M. when it fell nearly calm, the weather then looking dismal with continued flashes of vivid lightning and loud peals of thunder, got all the canvas secured as fast as possible, which we had just time to do when the gale burst out from about S. S. W. Fortunately we were prepared for it, and had nothing set but a new small close reefed main-top sail, which we lay to under till noon, Bar. stationary at 29.25. It is impossible for me to describe the sea that we had to contend with. It had been blowing a gale (and no ordinary one,) from N. N. E. round to S. S. W. for the last three days, and every way we looked a mountain of water appeared coming towards us. Shortly after noon the Bar. started up to 29.80, but the gale continued without any abatement till midnight.

3*rd December.*—The gale began gradually to abate and the Sea to fall; Barometer at daylight up to 29.90.

Abridged Log of the Ship FYZUL CURREEM, Captain J. BALLANTINE, *from Calcutta towards the Mauritius, reduced to civil time.*

26*th November,* 1843.—Noon, fine breeze N. and cloudy, Lat. 7° 50′ N. Long. 83° 59′ E., course South, 7 knots per hour. P. M. and to midnight squally. Wind steady at North and N. by E.

* These fluctuations are highly interesting particularly when limits are given.—H. P.

27*th November.*—A. M. to 9; Wind about North; 10 to Noon N.N.W. squally; noon Lat. 5° 11′ N. Long. 83° 36′ E., 9 P. M. heavy squalls, wind and rain from N. N. W. to midnight.

28*th November*—A. M. to noon, fresh breeze, &c. tolerably clear; wind varying N. N. W. to N. W. b N., 8.30 A. M. an English bark standing to the Northward and Eastward. Noon Lat. 2° 6′ N. Long. 83° 40½ E.; by 8 P.M. increasing to fresh gale W. b S.; to midnight course South, 8 knots throughout.

29*th November.*—A. M. fresh gale West increasing with heavy squalls to a strong gale and sea by noon, when Lat. 00° 54′ S., Long. 84° 30¼′ E., Current of about 24 miles to the Eastward. P. M. Gale continuing and increasing at times, to midnight, wind strong at West and course South 7 and 8 per hour.

30*th November.*—8 A. M. more moderate, noon fresh gales. Wind steady at West throughout. Lat. account 3° 50′ S., Long. 85° 27′ E. Current of 21 to the Eastward. P. M. more moderate and clear, wind West; and at 7 P. M. W. ½ S., midnight moderate and clear, a strong sea from the W. S. W.

1*st December.*—A. M. a little squally; by 10 A. M. wind at N. N. W. light 3 knot breeze; noon fine, Lat. 5° 39′ S. Long. 85° 37¼′ E. Current and sea estimated by Captain Ballantine at 29′ to the E. N. E. a strong sea from the W. S. W. P. M. winds N. N. W., and at 9 N. W. and fine to midnight.

2*d December*—A. M. to noon, light N. N. E. winds with a heavy *head* sea. (Ship steering S. W. by S.) Lat. 6° 41′ S. Long. 85°00¾′ E. no current, but the sea has retarded the ship's progress 10 miles.

Mauritius Ship News *from the Englishman.*

We are indebted to Captain Renaut of the Ship Active, for the following details respecting the hurricane which he experienced on the 30th November. On the 24th November, the weather was very tempestuous, blowing from the S. W. and veering round to the N. W. then N. E. and finally settled at E. on the 30th, and blew a perfect hurricane for 48 hours in Lat. 10° 23′ S. and Long. 85° 17′ E. The gale abated on the 2nd December in Lat. 13° 58′ S. and Long. 13° 31′ E. The Ship sustained the loss of a few sails and a quarter boat; but fortunately none of the coolie passengers on board sustained any injury.

The Bark Ward, Chapman, from Bombay, reports having experienced a hurricane in Lat. 12° 30′ S. and Long. 84° 30′ E. commencing on the 30th November from S. W. and blowing right round the compass. It abated however on the 3rd December, Lat. 14° S. and Long. 79° 30′ E ; she lost a few sails.

Abridged Log of the Barque FLOWERS OF UGIE, *Captain* ANNAND, *from Madras to the Mauritius, reduced to civil time.*

24*th November,* 1843.—The Log worked back from 25th, gives for this day, Lat. 4° 57′, Long. 84° 33′ E. with light Southerly and S. S. W. airs and breezes, from noon to midnight.

25*th November.*—A. M. heavy squalls and rain, wind S. and S. b W. to noon when strong gale about S. S. W. Lat. 5° 36′ S. Long. 85° 27′ E., Bar. 29.80, Ther. 81° high cross sea. P. M. to midnight strong gale S. W. by S. with squalls and rain; preparing for bad weather. Midnight Bar. 29.68.

26*th November.*—To Noon gale increasing from S. W. Lat. 6° 5′ S. Long. 86° 21′ E., Bar. 29.62, Ther. 81°. P. M. increasing and S. W. b. W. 6 P. M. hove to under bare poles. Heavy sea running, midnight the same.

27*th November.*—4 A. M. weather a little clearer, noon heavy gales Lat. 6° 20′ S. Long. 88° 4′ E., Bar. 29.57, Ther. 83°. Easterly current of 60′ since noon of the 26th. P. M. wind W. N. W. At 10 N. W. to midnight.

28*th November.*—4 A. M. wind hauling to the North, being N. N. W., at 2 A. M., when the ship bore up and ran 27′ to the S. W. by S. when hove to again, having sprung the fore-topmast in rolling. Noon wind about N. N. W. Lat. Obs. 7° 41′ S. Long, 88° 49′ E., Bar. 29.63. Ther. 84°. P. M. wind North. Strong gales and heavy sea to midnight.

29*th November.*—A. M. apparently moderating, noon strong gales Lat. 8° 46′ S., Long. 87° 40′ E., Bar. 29.67, Ther. 83°. 10 A. M. bore up and steered S. W. b S., P. M. strong gale N. N. E. Ship running to the S. W. b. S. to midnight. Bar. at 4 P. M. 29:66 and wind at 10 P. M. N. E., midnight strong gales and Bar. 29.69.

30*th November.*—At 8 A. M. wind N. E. b E., strong gale heavy squalls, turbulent sea, and Bar. falling, 9 A. M. hove to again, hav-

ing since 10 A. M. on the 29th, ran 158 miles to the S. W. b. S., noon heavy gale, Lat. 10° 52′ S., Long. 86° 24′ E. Bar. 29.59. Ther. 83°. P. M. wind N. E. Strong gales, heavy squalls and a dark cloudy appearance all round in the sky. 2 P. M. Bar. 29.58. At 10 P. M. Bar. 29.53. Gale very heavy; at midnight Bar. 29.49.

1*st December.*—2 A. M. wind E. N. E. 8 A. M. abating a little, 10:30 bore up again to S. W. Noon strong gales Lat. 11° 2′ S., Long. 86° 6′., Bar. 29.50, Ther. 84°. P. M. Wind N. E. b E., 4 P. M. Bar. rising, midnight strong gales and heavy squalls, ship running to the S. W.

2*nd December.*—4 A. M. to noon moderating; 10 A. M. Wind N. E. ship steering to S. W. Noon clearing away, Lat. 13° 20′ S. Long. 83° 49′ East. Bar. 29.83, Ther. 86°. P. M. fine E. N. E. breeze to midnight.

3*rd December.*—Noon fine, lat. 14° 22′ S. Long. 81° 15′ E., Bar. 29.87, Ther. 85°.

Abridged Log of the Ship JOHN FLEMING, *Capt.* CLERK, *from Calcutta bound to Mauritius, reduced to civil time. N. B. Some additions made from a letter of Capt.* CLERK'S *forwarded by Captain* BIDEN.

21*st November* 1843.—The weather, from calm and cloudy with light airs on the 20th and 21st, is at 5 P. M. on the 21st marked as " heavy cloudy weather in the North West."

22*d November.*—At 5 A. M. the wind became steady at W. S. W. At noon fine and cloudy, Lat. 00° 30′ North, Long. 82° 29′ E. P. M. to midnight wind about S. W. ship running to S. E. and S. b E. 7 and 8 knots.

23*d November.*—A. M. squally; at 8 A. M. wind West, 8 knot breeze, course South. Noon strong breeze and cloudy, Lat. 2° 15′ S. Long. 83° 30′ E. Ther. 82°, Bar. 29.72. P. M. wind W. b N. and at 5 W. S. W., midnight heavy cloudy weather.

24*th November.*—A. M. increasing, noon under close reefs, strong gale W. S. W. and thick weather with rain, Lat, 4° 47′, Long. 84° 30′ E. P. M. to midnight wind W. b S. hard squalls, strong gale and heavy sea. Course to the S. and S. S. E. 5 knots.

25*th November.*—A. M. moderating a little, high head sea, noon Lat. 5° 1′ S., Long. 85° 31′ E., Bar. 29.70., Ther. 78° P. M. wind W. S. W. more moderate; to midnight heavy head sea continues.

26*th November.*—A. M. to noon wind W. S. W. At noon every appearance of a gale, Lat. 5° 58′ S. Long. 86° 24′ E., P. M. wind marked S. W. b. W. blowing very hard; Bar. falling to 29.50, lying to under storm staysails, head to the S., midnight blowing excessively hard.

27*th November.*—A. M. Sea increasing; at noon Lat. 6° 26′ S., Long. 87° 10′, Bar. 29.50. Ther. 80°, P. M. Bar. 29.40, heavy gale (apparently from N. W. or W. N. W.*) continues till midnight.

28*th November.*—A. M. wind drawing to N. W. (ship coming up to W. S. W.) Noon more moderate, Lat. 7° 7′ S. Long. 87° 24′ E., Bar. 29.50, Ther. 80°. P. M. wind marked N. N. W. gale continuing; very irregular sea. At 8 P. M. wind had veered to N. E., ship running S. W. b S. and S. W. 98 miles from 11 A. M. to midnight when strong gale.

29*th November.*—A. M. Increasing to a hurricane about N. E.; noon Bar. 29.00, Ther. 79°, Sympiesometer 28.9, ship on her beam ends. Lat. 8° 47′, Long. 86° 20′. P. M. Hurricane between North and East, head to N. N. W., Bar. broke; oil disappeared in the Simp. At midnight ship buried in the sea and half swamped.

30*th November.*—A. M. Cut away the top masts which relieved her a little; boats blown into the rigging and over the poop, at 4 blowing a hurricane still between North and East.

1*st December.*—To noon still blowing a heavy gale; Sympiesometer 28.4. at noon, oil having re-appeared; at 5 A. M. set a storm staysail, moderating to midnight.

2*d December.*—To noon moderating, wind not marked, Lat. obs. 14° 5′ Long. 79° 29′; 7 P. M. wind marked N. E. At midnight fine.

* Nothing is marked in the Log, but it is clear that the wind must have been to the Northward of West, at least since midnight, by the Lat. for lying to under storm staysail, with a gale from S. W. b W. the ship must have been making northing at least from noon to nearly midnight, when if we suppose the gale to have drawn to the Northward of West she may in the 12 hours to noon of the 27th have drifted back and made the most part of the 41 miles of Lat. which appear on the log to noon of the 28th; for it was only one hour before that time that she bore up.

Abridged Log of the Barque ELIZABETH AINSLIE, *Captain* T. LYSTER, *from Madras to the Mauritius, reduced to Civil time.*

23*rd. November*, 1843.—Noon, Lat. Obs. 3° 5′ S. Long. 84° 3′ Bar 29.80. Ther. 82°. During the preceding 24h had run 5 to 7 knots to the S. b. E. with winds varying from to S. W. b. W., wind W. b. S. to 8 A. M. when W. to noon, fresh breeze and latterly squally. P. M. the wind W. to midnight.

24*th November.*—Wind W. b. S. to 8 A. M. and W. to noon, when Lat. 5° 10′ S., Long. 84° 25′ E., Bar. 29.78. Ther. 79°. P. M. fresh breeze and squally wind W. to midnight.

25*th. November.*—To 5 A. M. Wind S. W. and to noon, S. S. W. and high swell from the Southward, Lat. Obs. 5° 41′ S. Long. 85° 50′ E. Bar. 29.78. Ther. 80° P. M. fresh gale increasing from S. W. b. S. and S. W., at 11 P. M. W. S. W.

26*th November.*—A. M. fresh gale W. S. W. to noon, and high sea from the Southward; noon Lat. 6° 26′ S. Long. 86° 53.′ E. P. M. hard gales and heavy squalls W. S. W. hove to till midnight head N. N. W. when *more moderate.*

27*th. November.*—Made sail to the Southward, and to noon ran 62 miles to the S. b. W. Winds 1 A. M. W. N. W.; 7 A. M. W. b. N.; at 10, W. N. W. fresh gales and cloudy with drizzling rain and high sea; noon Lat. Obs. 6° 27′ S. Long. account 87° 22′ E. Bar. 29.60. Ther. 80°. 1 P. M. wind N. W., 6 P. M. N. N. W. 10 P. M. North; midnight N. N. E.

28*th November.*—3 A. M. Hard gale from N. E. with heavy squalls; 4, hove to under close reefed main-top-sail, Bar. 29. 30; noon tremendous sea, Lat. acct. 8° 21′ S. Long. 87° 02′ E. Bar. 29.5. Ther. 80°. To 5 P. M. wind E. N. E.; 6 P. M. East. At 5 P. M. Main-top-sail blown to pieces and ship labouring greatly, set the reefed fore-sail and kept the ship before the wind. At 6 P. M. fore-sail blown out of the bolt ropes, broached to with head to the N. N. W. midnight, gale blowing with great violence, and tremendous high sea.

29*th November.*—5 A. M. A sudden lull and high confused sea. 7 A. M. commenced blowing from the North; noon, heavy thick cloudy weather all round, with a high confused sea, hard puffs and lulls at times, Bar. 29.00, Ther. 77°. At 1 P. M. wind S. E.; at 6, to 8, North; at 9, N. N. W.; at 12, North, heavy puffs, and lulls with a high sea. Bar. 29.00.

30*th November.*—Wind North to noon, at 2 A. M. Bar. 28.90. At 4, Bar. 28.80.; at day-light blowing very hard with tremendous gusts at times. Noon, Bar. 28.80, Ther. 78°; lying to with ship's head to the West. P. M. commenced a perfect hurricane, ship on her beam ends, and expecting masts to go at every moment, every thing ready to cut away. 4 P. M. Bar. 28.90.; 6 P. M. still blowing violently. 7, wind North, the furled main-sail blown from the gaskets. 8, Bar. 28.90, wind N. N. E. Midnight, weather the same, Bar. 29.00. lying to, head West to W. N. W.

1*st December.*—Daylight inclined to moderate, wind from N. N. E., to noon Bar. 29.10, head N. W.; noon, heavy puffs and lulls with thick cloudy weather, and much rain, Bar. 29.20. Ther. 78°. At 6 P. M. Bar. 29.30. At 8 P. M. Bar. 29.35., midnight 29.45. P. M. wind N. E.

2*d December.*—6 A. M. Bar. 29.50., noon 29.70. making sail; Lat. 12° 34′ S., Long. 81° 55′ E., pleasant breeze N. E.; 4 P. M. E. N. E, 9 P. M. N. E.

3*d December.*—Noon, Lat. 14°. 6′ S. Long. 80°. 53′ E. Fine weather.

Abridged Log of the Ship EDMONSTONE, *Capt.* MACDOUGAL, *from Calcutta bound to Mauritius, reduced to Civil time.*

25*th November.*—At noon in Lat. 6° 15′ S. Long. 82° 30′ E., P. M. Winds variable from the S. W. to S. S. E.; to midnight, light breezes and cloudy.

26*th November.*—Steady light breeze to noon from S. S. W., no observation, Lat. account 6° 42′ S. Long. account 83° 06′ E. P. M. to midnight, winds S. S. W. to South, brisk breeze.

27*th November.*—A. M. strong breeze about South, with hard squalls and turbulent sea. Lat. Obs. 6° 58′ S. Long. 83° 36′ E., P. M. variable strong breezes from the Southward with hard squalls. Midnight "strong gale."

28*th November.*—A. M. strong gale and mountainous sea. Wind about S. S. W. Noon, Lat. Obs. 6° 50′ S. Long. 84° 04′ E. P. M. wind S. W.; gale increasing to midnight.

29*th November.*—2 A. M. wind W. S. W. severe gale; 9. A. M. hove to under reefed try-sail, wind West, no observation; Lat. account 7° 12′ S. Long. 85° 02′ E. P. M. "violent gale W. b. S.," heavy cross sea.

8 P. M. " wind hauled to W. N. W. and moderated, Bar. rising; 10 P. M. W. N. W. made sail and stood to the S. S. E. 9′ till midnight.

30th November.—3 A. M. wind N. W.; at 6, N. N. W. Daylight, gale increasing, and Bar. falling; to noon, severe gale N. N. W. with furious gusts, Lat. account 9° 3′ S. Long. account 85° 4′. E.; 9 P. M. wind N. N. W. severe gale and high cross sea; at 8, wind N. b. E. to midnight, when Bar. rising a little.

1st December.—By 9 A. M. strong gales N. E., to noon Lat. by account 11° 15′ S. Long. account 84° 22′ E. P. M. the same, wind N. E. to midnight; carried away chain plates and hove to; midnight more moderate.

2d December.—A. M. moderating to noon; wind N. E. to 9 A. M. and North to noon, when Lat. 12° 23′ S. Long. 84° 30′ E. P. M. wind N. E., moderate breeze and heavy cross sea.

3d December.—Noon, Lat. 13° 51′ S., heavy sea still continuing, wind E. N. E. and fine.

Note.—Captain MacDougal informs me that during the storm, his Bar. was at 29.38 and the Symp. at 29°28′ the lowest, the Ther. steady at 72° throughout the gale.

The Lat. and Long. given, are partly from the chart, and partly from account worked either forward or backward to the nearest day of observation, Captain McDougal observes that having 220 emigrant coolies on board, he was obliged, during the height of the storm, to steer various courses to obtain for them as much comfort and safety as the weather would allow of, so that he can only give me limits *within* which he thinks the vessel's position must have been.

The log gives as nearly as can be ascertained, a current of 149 miles to the South and 116 miles to the West, but it is necessarily very imperfect, and the set of the storm wave and current on one day was doubtless counteracted, in some degree, by that on a different part of the storm circle on another.

Abridged Log of the Barque Baboo, *Captain* Stuart, *from Madras to Mauritius, reduced to Civil time.*

26th November, 1843.—At Noon, Lat. 6° 17′ S. Long. about 83° 40′ E., wind S. W. b. S., ship steering to the S. E. b. S. 4½ knots, squally and rain. Spoke the Tartar 7 days from Ceylon. Midnight, wind S. S. W.

27*th. November*—A. M. to Noon strong breeze and cloudy; no Obs.; P. M. fresh gale S. S. W., 6 P. M. South, course E. S. E. Midnight heavy squalls and rain.

28*th. Nov.*—A. M. Heavy squalls and rain continuing, wind from S. to S. W., course S. E. to S. S. E. Noon Lat. 7° 8′ S. Long. 85° 10′ E., heavy gales S. W. b. W. and sea. P. M. Wind W. S. W. at 6 and to midnight when strong gales and rain; course marked as S. b. E. to S. b. W. In the Newspaper report Captain Stuart states this to be the day on which the wind became very tempestuous.

29*th. Nov.*—A. M. Strong gales continuing W. S. W. and at 6 A. M. this day, course S. S. W. Noon heavy gales throughout. P. M. increasing, wind marked N. W. Course S. W. and at midnight S. b. W,

30*th. Nov.*—Daylight heavy squalls and rain N. W. Course S. W., 7 knots. Noon. Lat. 9° 2′ S. Long. 85° 9′ E. strong gale. P. M. wind N. W. Midnight heavy squalls and rain.

1*st December.*—Wind N. W. to noon; course S. W. b. S. and S. W. Lat. 11° 0′ S. P. M. heavy gale N. N. W. Course, 7½ knots to S. W. and at 6 P. M. to W. S. W. Heavy gale and rain; midnight increasing.

2*d. December.*—Wind and weather as before, course W. S. W. 7½′; Noon, no observation. P. M. wind marked Easterly, course W. b. S. Heavy gale and squalls to midnight.

3*d. December.*—Wind Easterly, course W. b. S. 7½ knots. Noon, heavy gale, no observation. P. M. wind Easterly, course W. S. W. 6 P. M. wind N. E. Hove to at 8 P. M.

4*th. December.*—Mizen top-mast went, lost main-yard and sprung main-mast, ship labouring *as if in broken water on a reef.* No observation. P. M. fresh gale *and fine*, wind E. N. E. lying to; midnight moderate and fine.

5*th. December.*—6 A. M. bore up to the W. by S. Wind Easterly, noon Lat. Obs. 18° 6′ S. Fine weather.

Abridged Log of the Ship SOPHIA, *Capt.* ANDREW, *from Bombay towards the Mauritius, civil time.*

On the 22*d November.*—At noon the Sophia was in Lat. 4° 53′. S. Long. 79° 54′ E. standing till midnight to the S. S. E. with a moderate breeze from the S. Westward, squally weather.

23*d November.*—Threatening dark weather and puffy, to noon, when Lat. 5° 54′ S. Long. 80° 30′ E. P. M. to midnight, strong breeze and cloudy; ship standing to the E. S. E. and E., wind S. S. Westerly, throughout heavy head swell; midnight more moderate.

24*th November.*—At 4: 30 A. M. a heavy squall and shift of wind from S. S. E. to W. N. W. when a strong breeze and heavy head sea, ship standing to the S. E.; noon Lat. account 6° 30′ S. Long. 81° 20′ E. P. M. wind S. W. b. S.; midnight squally and calm.

25*th November.*—Throughout variable, squally and calm; noon Lat. Obs. 5° 50′ S. Long 81° 49′. E. Midnight moderate and squally weather.

26*th November.*—Moderate S. S. W. breeze to noon, when Lat. Obs. 6° 24′ S. Long. 82° 53′ E. 6 A. M. saw the bark Ward, Chapman, from Bombay; 8 P. M. wind S. fresh breeze and cloudy, ship standing to the West and W. b. N.

27*th November.*—Wind South to noon. Standing S. E. b. E. to 8 A. M. when W. b. N. for 2 hours and again S. E. b. E., strong breezes and a heavy, S. E. swell; noon Lat. Obs. 6° 36′ S. Long. not given; P. M. to midnight hard squalls.

28*th November.*—Wind from S. b. E. to S. S. W. of variable strength, and with thick weather, noon Lat. 6° 23′ S. Long. 81° 34′ E. P. M. increasing with a heavy head sea from the Southward from 3 P. M. to midnight, wind S. W. and S. W. b. W.

29*th November.*—Wind S. W. b. W. to S. S. W. to noon strong breeze and high head sea. Lat. noon 6° 48′ S. Long. 82° 00′ E. P. M. increasing in puffs Westerly and W. N. W. "very dirty appearance all round the horizon."

30*th November.*—Wind N. W. throughout, A. M. increasing to a gale with tremendous puffs at intervals; daylight heavy gale; noon hard gale, no observation; P. M. heavy sea in all directions; ship lying to, up S. W. off S. S. W. 1 and 2 knots.

1*st December.*—A. M. heavy gales and a fearful sea running in all directions, lying to under a close reefed main-top-sail and foresail. 6 A. M. moderating a little. Wind marked N. W. throughout, no observation; P. M. still moderating. Midnight heavy sea running from the S. Westward; wind veering a little to the Northward apparently.

2*d December.*—A. M. wind marked North, fresh breeze and cloudy with cross sea; noon Lat. 9°56′S. and Long. 81.48′ E., wind and weather the same to midnight.

3*d December.*—Wind marked N. N. E. to midnight, and fine weather; noon Lat. 11° 7′ S. Long. 80°49′ E.

Abridged Log of the Ship FUTTLE ROZACK, *Captain* RUNDLE, *from Calcutta to Mauritius, civil time.*

This very able, careful, and really scientific log, which reflects the highest credit on Captain Rundle, was kindly placed at my disposal by him, being his private one. Every nautical and scientific man will I am sure join with me in wishing we had many such observers afloat, and access to their observations. I need not say that with the necessary abridgment as to manœuvres and private matters, I have as nearly as possible preserved Captain Rundle's expressions.—H P.

On the 20th November, 1843.—The Futtle Rozack, at noon was in Lat. 0°39′ N. Long. by 2. Chrs. 82° 30′ E. and Bar. 29.93.* Ther, 78° Winds variable between W. S. W. and S. W. with light fine weather; at 8 P. M. a fresh breeze and squalls, sun-set very fiery, Bar. is high. At midnight squalls less frequent, course S. a little Easterly.

21*st November.*—1 A. M. to 4, strong breeze smart squalls and torrents of rain. Noon, pleasant weather, Lat. Obs. 1° 22′ S. Long. 83° 10′ E. Bar. 6 A. M. 29.93. Ther. 79°; noon Bar. 29.93. Ther. 82°, winds ,A. M. S. W. to W. N. W. and at times South. P. M. moderate breeze and passing squalls; a long Southerly swell just perceptible, clouds A. M spherical cumuli and nimbus. P. M. cumuli and dark nimbi; wind P. M. West and W. N. W. and N. W. in the squalls; P. M. Bar. 5 P. M. 29.93. Ther. 80°, at 11 P. M. Bar. 29.03. and Ther. 80°. At 9 P. M. Capt. R. remarks, " I observed those modifications of lightning more like the Aurora Borealis which I have seen in the North sea, or rather more like the Aurora Australis which I have seen off Van-Dieman's Land and New Zealand. I have never seen it in low Lats. but as a precursor of strong weather. It gradually lightens up the western horizon with a sudden dark red glare, and thus flickers about for a few seconds and gradually disappears. Bar. is still high. The stars too have a very sickly appearance, and a peculiar

* As corrected by comparison with the Standard at Calcutta.—H.P.

dancing motion. I thought at first my eyes deceived me, but my mates observed the same; I suppose occasioned by some dense vapour."

22*d November.*—A. M. wind marked S. S. W. to West; course from 3 to 7 knots to the Southward. Squally, making preparations for bad weather. Noon, Lat. Obs. 3° 18′ S. Long. Chr. 83° 22′ E. Lunars 83° 10′ E. Current for the last 24 hours S. E. b. E. 26′. Clouds A. M. cumulo stratus with flying nimbus, Bar. 1 A. M. 29.93. Ther. 79°; 6 A. M. 29° 93′ and 78°; noon 29° 88′ and 82°.

P. M. Squally, winds West to W. b. N. 4 P. M. scud flying swiftly to the Southward, 8 P. M. observed many phosphoric flashes in the sea, the luminous space from one flash as large as the cutter; running 6 and 7 knots to S. b. W.; midnight fresh breeze. Bar. 9 P. M. 29.91, Ther. 80°; at 10 P. M. the same clouds P. M. at intervals lofty cirrhi, then again obscured, a nimbus and light scud flying to the South above all.

23*d November.*—A. M. to noon, winds West to S. W. 6 and 7 knots, breeze to noon, when Lat. 5° 22′ S. Long. 83° 53′ E., current 59′ N. E. b. E. for the last 24h. Bar. A. M. 29.70. Ther. 76°; at 8 A. M. 29° 50′ and 77°; at 10 P. M. 29.53 and 78°. Noon 29.46 and 80, clouds hemispherical cumuli interspersed with ponderous nimbi.

Capt. R.—remarks. "I find Bar. considerably fallen with an exceeding long swell from the Southward, and at 7 a high N. N. W. sea meeting the Southerly swell created an exceedingly turbulent sea. In the squalls the sea has a strange appearance, the two seas dashing their crests against each other shoot up to a surprising height and being caught by the West wind, it is driven in dense foam as high as our tops. The whole horizon has the appearance of ponderous breakers.

At 8, Bar. still falling; has there been a gale? Much electricity by the appearance of the clouds. Current 59 miles N. E. b. E. $\frac{1}{4}$ E. this 24h. P. M. breeze decreasing to $1\frac{1}{2}$ knots, winds West to South and at times calm. Clouds, strata and nimbi, making preparations for bad weather, appearances being suspicious, 11. 30 P. M. Lat. by Aldebaran 5° 37′ S., midnight squally, rain and calms, dark dismal appearances all round and increasing Southerly swell.

24*th November.*—Dark and gloomy winds variable from S. E. to S. W., Noon, Lat. 5° 32′ S., Long. 84°.49′ E., Bar. 5 A M. 29.57. Ther. 77°. At 9, 29. 63 and 78°, at noon, 29. 64. and 80°. Clouds, low strata and nimbus. Currents apparently 30 miles N. E. b. E. $\frac{3}{4}$ E. for the last 24h.

P. M. A French and English barque in company, the English we supposed the Baboo, Capt. R. remarks "I do not like this gloomy weather; with wind lulling and then coming on again with a warning noise * there either has been or will be bad weather. At 4 calm, at 5 severe squalls from S. S. W. tremendous high sea from the Southward, ship rolling dreadfully at intervals. Bar. at 4 P. M. 29.63; at 8 P. M. 29.63. clouds marked as very low, scudding stratus to the Southward.

25th November.—A. M. wind South veering to S. W. "and vice versa," strong gusts from S. to S. W. with a high cross sea, occasioned by a short Northerly sea meeting the long South swell. Noon, strong gale at intervals, but decreases as the wind hauls to S. W. increasing to Southward, ship under close reefed main-top-sail and fore-sail Lat. 5° 42′ S., Long. 85° 3′ E., standing to the E. S. E., a current N. W. 7½ W. 27 miles in 24h. Bar. at 6 A. M. 29.64, Ther. 76°; 9 A. M. 29.64 and 78°, noon 29.63 and 80°. Clouds marked as low stratus, at times scudding to the South, at times stationary, then flying to the N. E.

P. M. strong gales S. W. b. S. mostly from S. W. attended with violent squalls. The rain water exceedingly cold, the sea water very warm, much more so than usually. Two Barques still in sight a head 5 P. M. mountainous sea from the Southward. Lofty scud above the lower strata of clouds flying quickly *to the Southward* at 7, breaks in the clouds, stars visible, but very dull. Bar. at 6 P. M. 29.62, Ther. 77°. At 10, 29.61. and 77°. Midnight wind in severe gusts succeeded by lulls of a few minutes duration. Clouds, low stratus not perhaps at 100 yards height, flying before the wind, breaks at times in the clouds, stars visible, with lofty scud flying with inconceivable rapidity *to the Southward.*

26th November.—A. M. Laid to under close reefed main-top-sail. Wind S. to S. W. squalls with rain, exceeding turbulent sea, noon Lat. 5°. 30′ S. Long. 86°. 23′. E., Bar. 6 A. M. 29. 62, Ther. 78°; at noon 29.63, and 80°, clouds very low stratus with lofty scud above all flying to Southward, nimbus at intervals. Strong set to N. E. b E. 65 miles for the last 24th. P. M. fresh gale with furious squalls

* This warning noise I have more than once adverted to as certainly heard also on shore; see Jour As. Soc. 7th memoir Vol. XI, p. 1000. but it might *there* be supposed to arise from local causes. It is curious to find it remarked at sea by such an attentive observer. What can it be occasioned by? See remarks in summary.

and rain as cold as ice. Edging away to E. S. E. and S. E. b. E. under two close reefed top-sails, wind S. W. and at intervals W. S. W. and West. At 8, ropes and gear on deck brilliantly spangled by small luminous sparks from the sea which when examined appeared to be fragments of Medusœ. Again visible to the W. S. Westward the sullen red glare and flickering lightning; midnight squally, sea presenting flashes of phosphoric light in all directions, Bar. at 9 P. M. 29.63, Ther. 78°, clouds low stratus and ponderous nimbi.

27*th November.*—A. M. Increasing gale West, and at 2 N. W. to Noon; very high sea; at 1, wind *shifted* from W. S. W. to N. W. creating a tremendous sea; 10 A. M. struck by a heavy sea which laid the ship on her beam ends, lost main-top-mast; scudded before the wind to the S. E. under barepoles. A. M. Bar. falling rapidly, noon Lat. by D. R. 6° 38′ S., Long. 86° 53′ E., Bar. 5½ A. M. 29.63. and Ther. 79°. at 7h. Bar. 29.62; at 9h. 29.57; at 10h. 29.53; at 10½h. 29.50; at 11h. 29.47; at 11½ 29.44; at noon, 29.43 and Ther. 80°, clouds throughout exceeding low stratus.

P. M. Wind N. W. to 10 P. M. when North; course S. E. to 10, and then South; 3 feet water in the hold and most of the crew sick; vessel making only 4 knots per hour before the wind and labouring excessively. At 6 Bar. rising very fast, and at midnight falling again with dark gloomy threatening weather all round. Bar. at 2 P.M. 29. 46, Ther. 81°; at 4h. Bar. 29. 47; at 5h. 29. 56; at 6h. 29. 62; at 7h, 29. 63, and Ther. 79°; at 9h. 29. 61; at 9½h. 29. 58; at 10½h. 29. 62; at 11h. 29.50; at midnight 29.49. Ther. 77°, clouds, exceeding low stratus.

28*th November.*—Wind N. E. the whole 24h. A. M. increasing gale, wind *veering suddenly* to N. E., in a furious squall, lost fore-top-mast, ship lying to in much distress, Bar. 29.47 at 1 A. M. Ther. 79°; 2 A. M. 29. 45; 5 A. M. 29.44; at 6h. 29.43. Ther. 80°; at 11h. 29.45 Ther. 81°, noon 29.49 and 82°. Lat. D. R. 7° 39′ S. double Alt. 7° 47′ Long. 87° 17′ E., clouds low stratus with ponderous nimbi.

P. M. wind N. E. tremendous squalls blowing with inconceivable fury. The sea rising in huge pyramids yet having no velocity but rising and falling like a boiling cauldron. I have never seen the like before, I was in the height of the terrible hurricane of September 1834, in the West Indies, I have been in a tyfoon in the China sea, in gales off Cape Horn, the Cape of Good Hope and New Holland, but

never saw such a confused and strange sea, I have seen much higher seas, and I am sure wind *heavier* but then the sea was regular and the wind steadier.*

10 P. M. dreadful squalls and a confused sea, both cutters washed away and mizen-topmast carried away, blowing still harder but Bar. rising; midnight tried to set the fore-sail and scud but it was blown to pieces clouds low stratus and nimbus; Bar. 2 P. M. 29.49. Ther. 82°; at 5h. 29. 5 and 80°; at 10h. 29. 53; at 11h 29. 54; at midnight 29.56 and 79°.

29*th November.*—A. M. wind N. E. till noon, still blowing fearfully at times. Again tried to scud and ran S. by W. 58 miles to noon, Bar. steadily rising, 10 A. M. good sight for Chr, 2 A. M. Bar. 29.57; at 7h. 29.57. and Ther. 79°; at 10h. 29.58. and 80°; at noon 29.59. and 81°. Lat. 9° 47′ S. Long. 87° 18′.

Noon blowing with inconceivable fury at times, with the sea I think more agitated and confused than ever; rising up in monstrous heaps and falling down again without running in any direction. Noon laid to again.

P. M. violent squalls and tremendous high sea, 3 feet water in the hold, wind N. E. to East. Midnight more moderate at times. Bar. 2 P. M. 29.60, Ther. 82°, and to midnight the same, but Ther. 79° clouds during this 24h. are exceeding low stratus scudding in all directions, upper strata to the Southward, lower to the west; at other times apparently to North and East.

30*th November.*—A. M. gale abates a little, high sea, ship lying to with tarpaulins in the mizen rigging, wind marked N. E. to East. Bar. 4 A. M. 29.60, Ther. 77°. Noon 29.61. Ther. 80°, Lat. 10° 55′ S. Obs. 10° 48′ S. by double altitudes Long. 86° 46′ E. Clouds low stratus.

P. M. moderate gale at times but the sea does not go down; at 4, heavy rain, wind N. E. throughout, midnight the same weather; heavy squalls of rain. Bar. 1 P. M. 29.61. Ther. 81°; at 6h. 29.61. and 78°; midnight clouds low stratus with nimbi.

* This is by far the clearest, most graphic and seaman-like description of "the pyramidal sea" found at, or near, the centre of Indian Hurricanes and to which I have frequently alluded in former memoirs, which I have yet met with.

1*st. December.*—A. M. gale and sea moderating. Winds N. E. to noon when Lat. 11°. 10′. S. Long. 85°47′ E. Bar. 6 A. M. 29.61. Ther. 77°. Noon 29.62. Ther. 81° Clouds cirro-stratus and nimbi. P. M. squalls of rain at intervals, wind N. E. to midnight. 6 P. M. Bar. 29.63, Ther. 80°; midnight 29.64. and 78°; clouds cirro-stratus and ponderous nimbi.

2*d December.*—Moderate and passing squalls, sea much gone down, repairing damages. Winds East to noon when Lat. 12° 30′ Long. Lunars 85° 26′ E. Chrò. 85° 34′. Bar. noon 29.67.

3*d December.*—At noon quite fine.

Abridged extract from the Log of the Barque WELLINGTON, *forwarded by Captain* BIDEN, *Civil time.*

30*th November,* 1843.—At noon in Lat. 13° 37′ S., Long. 84° 7′ E. Bar. 29.68. Ther. 82°. Wind marked E. S. E. Increasing to 2 P. M. when hove to, having prepared for bad weather.

1*st December.*—Wind marked East; gale increasing, noon Lat. 13° 25′ S., Long. 83° 47′ E., Bar. 29. 58. at midnight and noon, Ther. 82°, sea increasing.

2*d December.*—Heavy gale N. E. 9 A. M. saw a Barque scudding under reefed fore-sail. Noon Lat. 13° 5′ S., Long. 83° 27′ E., more moderate, 6 A. M. Bar. 29.58.; at 10, 29. 70., Noon 29.77. Sail made gradually.

3*d December.*—Noon, N. E. light breeze and rainy, Lat. 12° 34′ S., Long. 84° 34′ E. Bar. 29.90. Ther. 71.

Extract from the Log Book of the Ship TRUE BRITON, *from London to Madras.—Capt.* C. C. CONSITT.

Friday 1*st December* 1843.—P. M. Wind E. by S. commenced with a hard gale with occasional tremendous squalls with hail and rain. 8, wind increasing to a hurricane nearly, with a tremendous heavy sea, striking the ship severely, washing away the quarter galleries, above and below, and loosening the stern frame, causing the water to come in there rapidly and obliging us to keep a strong gang of hands in the lower after Cabins bailing continually, the lower deck completely afloat fore and aft, ship's sides and water-ways leaking

much, washed in and unshipped Larboard Cutter; daylight, found one of the shrouds of the main rigging carried away and the wedges round both fore-mast and bowsprit worked right out; blowing heavily at East with tremendous squalls and rain. Ship lurching and rolling heavily and shipping much water over all. The lower deck completely afloat, the water washing over the combings. No Observations.

Bar. ranging from 29.50. to 29. 60., Simp. from 29.2 to 29. 10. throughout the gale the Ther. 83°.

Saturday 2*d December*, 1844.—P. M. Wind E. by S. Hard gale with heavy squalls, rain and hail and a tremendous sea on; ship being struck very heavily about the stern frame and under the Larboard main channels, the quarter galleries completely gone, the quarter deck and waist ports stove and washed out, the sea rolling in on either side in a large body; 8 ditto weather; 10 The gale moderating and glass inclined to rise; midnight less wind with a high sea on, ship labouring severely, the sea striking her heavily and taking in much water on deck and below.

2*d December*.—Daylight found the driver-boom tossing astern. 8, wind still blowing strong with less sea; well 14 *inches;* throwing overboard 5 horses, that died from fatigue and want of air during the late bad weather; noon moderate and fine. Lat. Obs. 12° 58′ South. Long. 82° 30′. East.

I now, as in the former Memoirs, arrange the logs of the ships in tables to shew at one view the weather and winds prevailing over this great space of the ocean which, it will be observed, reaches on the 1st and 2d November, over 24 degrees of Lat. including the equator, and during 5 days with severe storms blowing on both sides of it. This is alone a Meteorological curiosity of no small interest.

Comparative Table of Winds and Weather from Latitude 15° North, to 15° South, and from 24th November to 3d December, 1843.

Date.	Name of Place or Ship.	Lat. N.	Long. E.	Winds and Weather.	Barometer.	Simp.	Ther.	Remarks.
Noon.		° ′	° ′	NORTHERN HEMISPHERE.			°	
24 Nov.	Winifred, ...	15 27	87 10	Steady N. E. breeze. ..	29.83	..	78	Fine clear weather.
		Lat. S.		SOUTHERN HEMISPHERE.				
	Flowers of Ugie, ..	5 08	84 24*	P. M. Light airs and squally to midnight.	.. .. ..	..	..	Midnight heavy squalls, South.
	John Fleming, ..	4 47	84 30	Strong gale W. S. W. and W. by S.	.. .. ..	..	..	Running to the Southward and under close reefs.
	Elizabeth Ainslie, ..	5 10	84 25	Fresh breeze and latterly squally W.	29.78	..	79	Standing to the Southward.
	Futtle Rozack, ..	5 32	84 49	Dark gloomy variable S. E. to S. W.	29.64	..	80	Standing to the E. by S. Tremendous high and confused sea from the Southward; wind falling and rising.
	Sophia, ...	6 30	81 20	W N. W. to S. W. by S. squally.	.. .. ..	..	..	4:30 A. M. shift S. S. E. to W. N. W. midnight 24th to 25th calm.
Noon.		Lat. N.		NORTHERN HEMISPHERE.				
25 Nov.	Carena, ...	4 58	....	Light air and calm. ..	.. .. ..	..	..	Near the Coast of Ceylon bound to Madras.
	Winifred, ...	12 43	86 23	N. E. strong breeze. ..	29.82	..	78½	Fresh and cloudy.
		Lat. S.	Long. E.	SOUTHERN HEMISPHERE.				
	John Fleming, ..	5 1	85 31	More moderate to midnight wind about W. S. W. ..	29.70	..	78	Strong head sea, ship steering to the Southward and Eastward.
	Elizabeth Ainslie, ..	5 41	85 40	S. W. to S. S. W. Noon S. S. W. fresh gale P. M. S. W. by S. and S. W...	29.78	..	80	Noon high swell from the Southward increasing fresh gale, midnight, W. S. W. steering to the S. E. and S. S. E.

* By account only.

Date.	Name of Place or Ship.	Lat. S.	Long. E.	Winds and Weather.	Barometer.	Simp.	Ther.	Remarks.
Noon.		° ′	° ′	SOUTHERN HEMISPHERE.			°	
25 Nov. 1843.	Edmondstone, ..	6 15	82 30	Variable S. W. to S. E. light breezes and cloudy..				
	Flowers of Ugie, ..	5 36	85 27	Heavy squalls and rain, noon strong gale South and S. by W. P. M. S. W. by S.	29.80	..	81	Bar. at midnight, 29.68.
	Futtle Rozack, ..	5 42	85 3	Noon strong gale at intervals S. W. to South P. M. mostly S. W. violent squalls.	29.63	..	80	High cross sea midnight heavy puffs and lulls.
	Sophia, ...	5 50	81 49	Variable squally and calms.	..	..	..	Midnight moderate and squally.
		Lat. N.		NORTHERN HEMISPHERE.				
Noon. 26 Nov.	Winifred.	9 40	85 48	Variable, to East dark and threatening P. M. strong beavy squalls, ...	29.80	..	78	
	Candabar,..	8 19	84 38	Variable from N. N. E., N. by E. and N. E. by N. squalls.	29.80			
	Fyzul Curreem, ..	7 50	83 59	Steady winds N. and N. by E.				
	Carena, ...	5 43	..	Strong winds and cloudy,				
		Lat. S.		SOUTHERN HEMISPHERE.				
	Edmonstone, ...	6 42	83 00	Steady light breeze to noon from S.S.W. P. M. S.S.W. to South brisk breeze,				
	John Fleming,.. ..	5 58	86 24	Every appearance of a gale, A. M. W.S.W. P. M. S.W. by W. blowing very hard.	29.50	..	..	Ship lying to under storm stay-sail, midnight blowing excessively hard.
	Elizabeth Ainslie, ..	6 36	86 53	To noon W. S. W. hard gale and midnight moderating a little.	29·65	..	80	Noon hove to, midnight under sail again.

Date.	Name of Place or Ship.	Lat. S.	Long. E.	Winds and Weather.	Barometer.	Simp.	Ther.	Remarks.
		° ′	° ′				°	
				SOUTHERN HEMISPHERE.				
Noon 26 Nov. 1843.	Flowers of Ugie, ..	6 05	86 21	Increasing gale noon; 10 P. M. wind S.W. P. M. S. W. b W.	29.62	..	81	Heavy sea, 4 P. M. hove to under bare poles.
	Baboo, ...	6 17	..	Wind S. W. b. S. ..	..	..	..	Strong to the S. E. b. S.
	Sophia, ...	6 24	82 53	S.S.W. to South fresh breeze and cloudy, ...	..	..	..	Standing to the West and W. b N.
	Futtle Rozack, ..	5 30	86 23	South to S.W. hove to, heavy gale and furious squalls; P. M. wind S. W., W. S. W., and West.	29.63	..	80	P. M. edging away to S. E. b. E.
		Lat. N.		NORTHERN HEMISPHERE.				
Noon 27 Nov.	Winifred, ...	7 4	85 56	E. N. E. 8 P. M. North; 4 A.M. N.N.W. thick gloomy weather and heavy rain, ..	29.67 4 A. M. 58	..	78	Sudden and dangerous gusts and violent squalls giving little warning, P. M. heavy squalls.
	Candahar, ...	9 5	83 50	N. E. & midnight N. E. b.E.				
	Fazzelbarry, ...	5 38	88 40	Moderate but threatening from Eastward, P. M. increasing to a gale, ..	29.72	..	82	Dark cloudy weather and a heavy N. E. sea. Bar. falling and 29.65 at midnight.
	Fyzul Curreem, ..	5 11	83 36	N. N. W. squally, P. M. heavy squalls N. N. W. to midnight, ...				
	Carena, ...	..	..	Light airs and dark cloudy weather, winds from N. N. E.	..	..	..	Near the Coast of Ceylon.
		Lat. S.		SOUTHERN HEMISPHERE.				
	Edmonstone, ..	6 58	83 36	Strong breeze South, with hard squalls and turbulent sea, midnight gale,				

Date.	Name of Place or Ship.	Lat. S.	Long. E.	Winds and Weather.	Barometer.	Simp.	Ther.	Remarks.
		° ′	° ′	SOUTHERN HEMISPHERE.			°	
Noon 27 Nov. 1843.	John Fleming, ..	6 26	87 10	Heavy gale about S. W. ..	29.50	..	80	P. M. Bar. 29.40; A.M. sea increasing.
	Elizabeth Ainslie, ..	6 27	87 22	Fresh gales with high sea from the W. N. W. wind N. W. b. N. N. W. 10 P.M. North, midnight N. N. E.	29 60	..	81	To Noon ran 62 miles to the S. b. W.
	Flowers of Ugie, ..	6 20	88 4	Heavy gale W. b. N. noon W. N. W. P. M. W.N. W. 10 P. M. N. W.	29.57	..	83	Lying to. Easterly set of 60′ from Noon 26th.
	Baboo, ...	..	..	Fresh gale S. S. W. P. M. Southerly.	.. .. ..	..	..	Course to the E. S. E.
	Sophia, ...	6 36	..	South and Southerly. P. M. to midnight hard squalls,.	.. .. ..	..	..	Heavy S. E. swell.
	Futtle Rozack, ..	6 38	86 53	N. W. at noon. Increasing gale, 10 P. M. North, ..	29.43	..	80	Tremendous sea, A. M. wind shifted from W. S. W. to N. W. ship scudding to S. E. and South; Bar. at midnight 29.49.
		Lat. N.		NORTHERN HEMISPHERE.				
Noon. 28 Nov.	Winifred, ...	4 27	85 58	N. W. to N. N. W. strong gales, heavy rain, and gloomy weather, ...	29.65 8 P. M. 60 4 A. M. 57	..	79	Confused sea 11 P. M. most terrific squalls.
	Candahar, ...	9 15	83 45	Strong *Monsoon* (?) N. E. b. E. 2 A. M. veering to the Northward.	29.70	..	..	Heavy squalls and a strong *monsoon?*
	Fazzelbarry, ...	7 22	88 10	6 A. M. N. E. Noon N. E. P.M. E. N. E. heavy gales,	29.54	..	81	Midnight gale increasing, Bar. 29.45.

Date.	Name of Place or Ship.	Lat. N.	Long. E.	Winds and Weather.	Barometer.	Simp.	Ther.	Remarks.
		° ′	° ′	NORTHERN HEMISPHERE.			°	
Noon 28 Nov. 1843.	Carena, ...	..	..	Fresh breezes and squally N E. b E. to N. N. W.	.. .. ..	..	..	Off the Coast of Ceylon.
	Fyzul Curreem, ..	2 06	83 40½	N. N. W. to N. W. fresh breeze, P. M. fresh gale West,				
	Edmonstone, ...	6 50	84 04	A. M. S. S. W., P. M. S. W. strong gale, ...	.. .. ..	..	..	Mountainous sea, gale increasing to midnight.
	John Fleming, ..	7 7	87 24	Noon, more moderate drawing to N. W. P. M. continuing N. N. W. 8 P. M. N. E.	29.50	..	80	Ship running to the S. W. b S. and S. W. 98′ from 11 A. M. to midnight, at midnight strong gale.
	Elizabeth Ainslie, ..	8 21	87 02	Wind E. N. E. hard gale with tremendous sea, P. M. E. N. E., 6 P. M. East. ..	29.5	..	80	3 A. M. Bar. 29.30 noon hove to under close reefed main topsail. Bore up at 5 P. M. at 6 broached to, midnight increasing. Heavy head sea from the South.
	Sophia, ...	6 23	81 34	S. by E. to S. S. W. with thick weather, P. M. S. W. to S. W. b W. increasing,				
	Futtle Rozack, ..	7 39	87 17	Wind N. E. throughout, heavy gale and tremendous squalls and sea, ...	..	..	..	Heavy gale N. E. throughout, the wind having veered to N. E. from North in a furious squall.

Date.	Name of Place or Ship.	Lat. S.	Long. E.	Winds and Weather.	Barometer.	Simp.	Ther.	Remarks.
		° ′	° ′	SOUTHERN HEMISPHERE.			°	
Noon 28 Nov. 1843.	Flowers of Ugie, ..	7 41	88 49	2 A. M. N. N. W and to midnight North, strong gales.	29.63	..	84	From 10 P. M. on 27 to 6 A. M. on 28th ran 40′ to S. W. b S. but sea increasing hove to again.
	Baboo, ...	7 8	85 10	A. M. S. to S. S. W. heavy squalls, noon S. W. b W. 6 P. M. W. S. W., to midnight strong gales. ..	.. .. ..	..	..	Ship running to S. E., S. S. E., S. b E., and S. b W.
		Lat. N.		NORTHERN HEMISPHERE.				
Noon 29 Nov.	Winifred, ...	1 20	86 30	N. N. W. Veering to West, violent squalls, dark dismal gloomy weather. ..	29.59	..	81	Succession of dangerous squalls and thick weather, Bar. rising and falling.
	Candahar, ...	9 26	83 48	Heavy breeze N. b E. P. M. increasing rapidly, every appearance of a storm, P. M. North, ...	29.70	..	..	6 P. M. hove to.
	Fazzulbarry,.. ..	..	87 20	Blowing furiously N. E. b E. Noon N. E., P. M. furious gale N. N. E. 11: 30 bore up.	29.41	..	..	Ship running to the Southward, and in great distress.
	Bittern.	5 33	..	S. W. Fresh gale, and squally, P. M. S. S. W. and S., 10 P. M. S. S. E.	29.35	..	..	4 P. M. Bar. 29.34

Date.	Name of Place or Ship.	Lat. N.	Long. E.	Winds and Weather.	Barometer.	Simp.	Ther.	Remarks.
Noon 29 Nov. 1843.	Carena, ...	° ′ ..	° ′ ..	NORTHERN HEMISPHERE. N. W. N. N. E. and W. N. W. with dark squally and threatening weather.	.. .. ..	..	° ..	Prepared for bad weather, lightning at night. Off Ceylon.
		Lat. S.		SOUTHERN HEMISPHERE.				
	Edmonstone,* ..	8 0 ?	83 6 ?	2 A. M. W. S. W. 9 West P. M. W. by S. and W. N. W.....	..	..	..	9 A. M. hove to. 10 P. M. bore up again.
	John Fleming,.. ..		86 20	Hurricane about N. E. P.M. between N. and E. ..	29.0	28.9	79	Ship buried in the sea, head to N. N. W.
	Elizabeth Ainslie, ..	8 40	85 07	5 P. M. a lull, 7 A. M. North, burricane, noon hard puffs and lulls, 1 P. M. S. E. 6 North, 9 N. N. W. ..	29.0	..	77	A. M. boats blowing from the davits.
	Sophia, ...	6 48	82 0	Heavy gale commenced, S. S. W. to S. W. b W. to West and W. N. W.	..	..	..	Very dirty appearance all round.
	Fyzul Curreem, ..	0 54†	84 31	Gale from West throughout.	..	..	..	Increasing steadily to midnight, gale continuing, position by estimate.
	Futtle Rozack, ..	9 47	87 18	N. E. till noon blowing most furiously, P. M. N. E. to East.	29.59	..	81	A. M. tried to scud. Noon bove to again.
	Flowers of Ugie. ..	8 46	87 40	8 moderating. Noon strong gales P. M. N. N. E. 10 P. M. N. E.	29.67	..	83	10 A. M. bore up and ran to S. W. b S. 4 P. M. Bar. 29.66.

* Latitude and Longitude, estimated only.
† This is a remarkable instance of Newspaper inaccuracy, this Lat. was 8.54 in all the papers!

Date.	Name of Place or Ship.	Lat. S.	Long. E.	Winds and Weather.	Barometer.	Simp.	Ther.	Remarks.
		° ′	° ′	SOUTHERN HEMISPHERE.			°	
Noon 29 Nov. 1843.	Baboo, ...	..	..	Strong gales W. S. W. and Westerly P. M. N. W. ..	..	..	..	Vessel running to the S. W. S. S. W. and S. b. W. position from estimate only.
		Lat N.		NORTHERN HEMISPHERE.				
Noon 30 Nov	Vernon, off Madras,	..	..	Fresh monsoon, N. N. E.	..	..	..	Steering to the Eastward from Madras roads from 7 P. M.
	AT MADRAS. ..	..	..	A. M. N. W. P. M. N. W.				
				8 A. M.	30.12			
				4 P. M.	29.92			
				10 P. M.	39.99	..	..	Surf very high and strong current to the Northward.
	Candahar, ...	9 40	8357	N. W. b. N. and N. W. heavy gale, ...	29.50	..	..	11 A. M. Terrific squall.
	Fyzulbarry, ..	7 22	87 35	3 A. M. North gale at its highest fury, noon moderating, P. M. N. N. E. 5 P. M. Easterly gale broken. Midnight strong breeze S. W.	29 40	..	82	Vessel first steering to the S. S. E. and then to N. E. with the S. W. breeze.
	Mary Imrie, ...	12 20	..	N. N. E. strong breeze dismal weather.	..	..	..	Bar. 30.3, noon 30.11, 2 P. M. 29.83.
	Bittern, ...	8 23	..	E. N. E. Fresh gale throughout.	29.34	..	..	5 P. M. Bar. 29.30 and 8. 29.41.
	Carena, ...	..	..	1 A. M. N. N. W. strong gales, at 7 Westerly, P. M. S. S. W.	.. .. ..	..	..	P. M. wind moderating and ship making some sail.

Date.	Name of Place or Ship.	Lat. S.	Long. E.	Winds and Weather.	Barometer.	Simp.	Tber.	Remarks.
		° ′	° ′				°	
Noon 30 Nov. 1843.				Southern Hemisphere.				
	Winifred,*	1 1	86 0	West, dismal weatber and violent squalls, varying to N. W.	29.64	..	83	Barometer vibrating greatly in the severe squalls.
	Sophia, ...	..	..	Hard gale N. W.				
	Edmonstone, ...	9 3	85 4	3 A. M. N. W. b. N., N. W. noon, severe gale, N. N. W. 8 N. b. E.	.. .. ..	..	..	Midnigbt Bar. rising a little.
	John Fleming, ..	..	..	Hurricane between North & East.	.. .. ..	..	..	Cut away top-masts. Boats blowing to pieces.
	Flowers of Ugie, ..	10 52	86 24	Strong gale N. E. b. E., noon N. E. midnigbt E. N. E.	29.59	..	83	Ran to the S. W. b. S. 158′ and hove to again. Bar. 2 P. M. 29.58. Midnigbt 29.49.
	Elizabeth Ainslie, ..	..	..	Wind Northb to noon, P. M. hurricane N. to. N. N. E.	28.80	..	78	Sbip on her beam ends, sails blowing from the yards, furious hurricane.
	Active, ...	10 23	85 17	Hurricane about East.				
	Ward, ...	12 30	84 30	Commencing gale from S.† W. on tbis day.				
	Fyzul Curreem, ..	3 50	85 27	Steady at West.	.. .. ..	..	..	Moderating from 8 A. M.
	Futtle Rozack, ..	10 52	86 0	Hurricane N. E. througbout, abating gradually. ..	29.61	..	80	A. M. gale abating a little, P. M. more moderate, heavy sea.
	Baboo, ...	9 2	85 9	N. W. strong gale to midnight.	.. .. ..	..	..	Running 7 knots to the S. W.
	Wellington, ...	13 37	84 7	E. S. E. increasing gale. ..	29.68	..	82	

* This vessel was on the 29th in the Northern Hemisphere.

† Lat. probably erroneous: See Summary.

Date.	Name of Place or Ship.	Lat. N.	Long. E.	Winds and Weather.	Barometer.	Simp.	Ther.	Remarks.
Noon 1st Dec. 1843.		° ′	° ′				°	
				NORTHERN HEMISPHERE.				
	Vernon, ...	12 5	83 29	N. N. E. to noon, P. M. N. E. and midnight E. N. E.	29.68	29 52		
	At MADRAS, ..	..	..	N. W. throughout, A. M.	29.984			
				Noon,	— 877			
				10 P. M.	— 953	..	..	Strong surf and Northerly current.
	At KAYTO N. E. part of Ceylon, ...	..	..	N. W. commencing about noon, ...	..	..	..	From noon increasing in violence till 6 P. M. of 2d.
	At DELFT Island, ..	..	..	Moderating N. W. veering to West and W. S. W. and increasing, ..				
	At PAUMBUM, ..	..	..	N. W. and freshening from N. E. at night, ..				
	Candahar, ...	10 32	84 3	A. M. heavy gale N. W., at 3 P. M. shifted to S. W., 5 N. W., 10 S. W. ..	..	..	..	Bar. at 3 P. M. fell to 29.40, noon to 3 P M. very little wind, midnight apparently steady at S. W.
	Niagara, ...	10 00	87 0	Hard gale, S. W. to E. S. E.				
	Fyzulbarry, ..	9 55	88 00	4 A. M. increasing S. S. W. gale, noon South, P. M. S. S. W.	7. 29.30 9. 29.45 11. 29.55 Noon 29.65 3. 29·75 10. 29.80	..	82	Midnight moderating.
	Mary Imrie, ...	10 4	84 1	Heavy gale about N. N. E. clearing little at noon, ..	29.60	..	..	Midnight very threatening, Bar. 29.25 wind hauling apparently to the Westward.

Date.	Name of Place or Ship.	Lat. N.	Long. E.	Winds and Weather.	Barometer.	Simp.	Ther.	Remarks.
				NORTHERN HEMISPHERE.			°	
Noon 1st Dec. 1843.	Col. Burney, ...	° ′ 6 50	° ′ 85 20 *	.. ..	.. .. ..	..	..	Dismasted.
	Bittern, ...	9 49	..	East fresh gale, midnight about S. b. E.	{ 29.24 29.49	.		Bar. 29.24 at noon to 29.49 at midnight.
	Carena, ...	9 51	..	Wind Southerly strong gale, 2 P. M. wind S. S. E., 11 P. M. S. E.	..	..	..	Latterly scudding under reefed fore-sail.
		Lat. S.		SOUTHERN HEMISPHERE.				
	Winifred, ...	3 15	86 56	N. W. dark gloomy weather and violent squalls, P. M. moderating.	{ 4 A. M. 29.74 Noon — 67 8 P. M. — 68	..	82	
	Edmonstone, ...	11 15	84 22	Strong gales N. E. to midnight.	..	..	..	4 P M. hove to.
	John Fleming, ..	..	..	Hurricane between N. and East.	..	28.4†	..	Moderating to midnight.
	Flowers of Ugie, ..	11 2	86 6	A. M. E. N. E. noon N. E. b. E. Strong gales and turbulent sea to midnight. ..	29.50	..	84	4 P. M. Bar. rising.
	Sophia, ...	9 56	81 48	Heavy gales and fearful sea, P. M. Moderating, wind N W. throughout.	..	..	..	Midnight heavy sea from the S. W.
	Baboo, ...	11 0	..	To noon N. W., P. M. heavy gale N. N. W.				
	True Briton, ...	..	..	Blowing heavy at East with tremendous squalls. ..	..	..	..	Bar. from 29.50 to 29.60. Simp. 29.2 to 29.10.

* According to the copy of Captain Durham's letter to his owner, it was in Lat. 6° 00 N. Long. 85° E. I presume the newspaper to be right as Captain Durham might have thought it unnecessary to state more than in degrees his true position to his owners whereas to the Master Attendant of Point de Galle he might probably have given it to minutes.

† Uncertain, oil having before disappeared.

Date.	Name of Place or Ship.	Lat. S.	Long. E.	Winds and Weather.	Barometer.	Simp.	Ther.	Remarks.
		° ′	° ′	SOUTHERN HEMISPHERE.			°	
Noon 1st Dec. 1843.	Fyzul Curreem, ..	5 39	85 37¼	10 A. M. N. N. W. Noon fine P. M. N. N. W. and N. W. to midnight.	.. .. ..	..	..	Strong sea from W. S. W. and current of 29′ to the E. N. E.
	Wellington, ..	13 25	83 47	East, gale increasing. ..	29.58	..	82	
	Elizabeth Ainslie, ..	..	..	Moderating to noon heavy gusts and lulls N. E., A. M. wind N. N. E. and P. M. N. E.	29.30 to—45	..	..	High sea or dark cloudy weather.
	Futtle Rozack, ..	11 10	85 47	Gale abating, N. E. throughout, ...	29.62	..	81	
		Lat. N.		NORTHERN HEMISPHERE.				
Noon 2d Dec.	Vernon, ...	11 48	83 38	9 A. M. E. b. S. P. M. Easterly 7 P. M. E. S. E. and fine...	29.69	29.54	81	2 A. M. wind shifted to E. S. E. confused sea and much lightning. P. M. moderating.
	At MADRAS, ..	..	..	6 A. M. N. W., P. M. North.	29.94 —.86 —.91	..	..	Strong North current and high surf.
	At KAYTO, ...	..	..	N. W. from 6 P. M. to midnight blowing with great fury.				
	At DELFT ISLAND, ..	..	..	6 A. M. heavy gale W. b. S. to midnight.				
	At PAUMBUM, ..	..	..	A. M. N. N. W. freshening and veering to Westward, midnight heavy gale W. S. W.	.. .. ..	..	..	Heavy bank to N. E. but no wind from that quarter.

Date.	Name of Place or Ship.	Lat. N.	Long. E.	Winds and Weather.	Barometer.	Simp.	Ther.	Remarks.
		° ′	° ′	NORTHERN HEMISPHERE.			°	
Noon 2d Dec. 1843.	Candahar, ...	11 10	84 4	A. M. violent gale S. W. 4. A. M. South P. M. S. S. E. and S. E.	29.40 to 29.80	..	..	Vessel steering to the North and N. W. round the Eastern and N. Eastern quadrants of the storm.
	Fyzulbarry, ...	11 17	19 45	Fine wind S.S.E. to E.S.E.	29.90	..	83	
	Mary Imrie, . ..	..	..	2 A. M. calm, afterwards hurricane from S. S. W. ..	29.25	..	..	P. M. Bar. 29.80.
	Bittern, ...	11 21	..	S. E. moderating, P. M. E. S. E. and S. E.	29.60	..	..	Midnight fine.
	Carena, ...	12 17	..	Fresh gales and cloudy, P. M wind S. E.	.. .. ..	..	..	Midnight fresh gale.
		Lat. S.		SOUTHERN HEMISPHERE.				
	Winifred, ...	4 21	87 34	Calms and fine, ...	29.74	..	83	
	Edmonstone, ..	12 23	84 30	Wind North and N. E. moderate and fine, ...	.. .. ..	..	..	Heavy cross sea.
	Elizabeth Ainslie, ..	12 34	81 55	Moderate and fine N. E. ..	29.80	..	79	High swell from the North.
	John Fleming, ..	14 5	79 29	Moderating to noon, P. M. Wind N. E.	.. .. ..	..	..	At midnight fine.
	Flowers of Ugie, ..	13 20	83 49	N. E, b. E. clearing up, P. M. E. N. E.	29.83	..	86	
	Futtle Rozack, ..	12 30	85 30	Wind East to noon moderate.	29.67	..	..	On 3d quite fine.
	Baboo, ...	..	..	P. M. wind marked Easterly heavy gale to midnight ..	.. .. ..	..	..	Ship steering to the W. b. S.
	Sophia, ...	9 56	81 48	North fresh breeze & cloudy.	.. .. ..	..	..	On 3d fine, Lat. 11° 7′ S. 80° 49′ E.
	True Briton, ...	12 58	82 30	Moderate and fine,				
	Fyzul Curreem, ..	6 41	85 01	Fine, ...	.. .. ..	..	..	Heavy head sea.
	Wellington, ...	13 5	83 27	N. E. moderating,				

PART I.

Summary.

Southern Hemisphere.

I have divided this summary into two parts to separate the storms of the Northern and that of the Southern Hemispheres from each other. If we review the tables, and this will be usually found the best means of forming an approximate judgment, at a glance we shall find, that,

On the 24th of November.—There is fine weather in the Northern Hemisphere with the Winifred in 15½° N. and we have no other Logs for that day in Northern Lat. nearer to the equator. In the Southern Hemisphere in Lat 4° 47′, S. a gale had so far begun with the John Fleming as to reduce her to close reefs, but her Bar. had not fallen below 29.72.: yet the thick weather, rain and heavy sea might be thought sufficient indication, that she was on the verge, at least, of the commencing storm, the centre of which must then have borne about S. S. E. to S. b. E. of her; as in the Southern Hemisphere we assume,—and this memoir will amply prove it,—that the revolution of the rotatory storms is from the South (on the left hand) to the West, North and East.

But we shall observe at the same time, that at Noon on the same day the Flowers of Ugie was, by her Log worked back from Noon of the 25th* within 12 or 15 miles of the John Fleming and yet she had but light airs, calms, and breezes from the South and S. S. W. from noon till midnight, when the weather began to be squally, increasing to a strong gale at Noon of 25th, though even then her Bar. was at 29.80.

We have then the Elizabeth Ainslie in 5° 10′ S. and Long. 84° 25′ E. or within 3 miles of the Ugie (though their logs do not mention being in sight of each other) and there are thus possibly errors in the positions

* The extract sent me begins on the 25th. Nautical time and though the Log is perfectly well and even carefully kept, it has the fault of adopting the Coaster form of marking the run per Log every two hours only; which thus always renders it in some degree obscure for purposes of after reference and exact calculation.

of all the ships sufficient to put them out of sight of each other.* This ship had also, up to noon, a fresh breeze and squally weather, and her Bar. at 29.78. the wind at West and W. b. S. and becoming more squally as she ran to the S. Eastward between noon and midnight. The Futtle Rozack was the next ship to the Southward, being in 5° 32′ S. and 84° 49′ E. on this day. As will be seen by her log, which is well worth an attentive perusal, she had indications of suspicious weather from the 21st in 1° 22′ S. and these were increasing every day; her weather on this day (the 24th) being dark and gloomy, with variable squalls and even calms at times, but with a tremendous high sea from the South, "the wind" lulling and coming on again with a moaning noise," her Bar. was yet at 29.64.† We have thus four ships, the John Fleming, Flowers of Ugie, Elizabeth Anslie, and Futtle Rozack, in a space comprised within 45 miles of Lat. and 25 of Long. so that allowing for slight errors of instruments and observations the whole were within less than a square degree of each other, and as we have seen they seem to have had just such variable *streams* of wind and intervals of calms or light breezes, with even fine weather, as we might suppose *a priori* to exist on the outer verge of a storm, and which those who have followed the investigations of them, both here and through Col. Reid and Mr. Redfield's works have found in both Hemispheres. It is curious that none of the other ships remark on this day, though they do so on the 25th, upon the heavy sea, so carefully noticed in Captain Rundle's remarks; I shall advert to this again. We may thus consider the gale of the John Fleming as perhaps a commencing *stream* of wind on the circumference of a vortex, for I must again reiterate here that while of course a storm must begin *somewhere* and *somehow*, we are profoundly ignorant, both of the *how* and the *where* it begins, whether at the centre or on the circumference, and what its effects at the circumference are both when beginning and after it is in progress, and can only therefore carefully register every fact which may tend to throw the faintest light upon the manner in which these tremendous phœnomena

* This however may not be the case; a Commander of one of the ships told me that there were "several of us close together when the gale commenced" and he meant *in sight*, for he remarked upon the want of preparation apparent in one or two vessels.

† Nearly correct, for its slight error of .07 was ascertained here.

first develope themselves, or are felt, at the extreme verge of their peripheries or at their centres.

We cannot therefore assign any centre for the storm on the 24th, for we have no evidence beyond the heavy swell just alluded to that it *was* fairly begun any where on that day; though it should be borne in mind that it may have been also *coming up* from a distance, and that the incipient gale of the John Fleming was perhaps an *extra-vortical* stream thrown off from the main body of the storm,* and the heights of the Bars. of the John Fleming and Ugie as late as noon of the 25th lends some countenance to the probability that the storm had formed and was really coming up. It is remarkable also that on this day the Fleming had the weather "more moderate" than on the 24th, while with the flowers of Ugie it was "a strong gale" at noon.

On the 25th November.—At noon it will be seen that these four ships the Fleming, Ugie, Ainslie, and Futtle Rozack, were all within a square space of 45 miles on each side, or as before, allowing for slight errors, all within a square degree, having made from 16 to 85 miles to the S. E. by Eastward. The Fleming was the northernmost ship, and in about 6° S., the other three nearly on the same parallel of 5.40. S. and from 85° to 85° 40′ East. The Fleming as above remarked has the weather moderating considerably on this day, and this is a proof that her gale of the 24th, was as we supposed, in all probability, an extra-vortical stream thrown off from the gale into which the other three ships 40 miles to the South of her, were now fairly entered.† They had all four on this day the high Southerly sea, which may be said for the Ugie, Fleming, and Ainslie, to have begun from midnight, 24th 25th, when the Ugie marks 2 points of lee-way and she begins her preparations for bad weather also from this time. Excluding the Fleming since she was not yet fairly in the storm and taking the three other ships just mentioned to *have* been within it, we find they had all the

* The vignette titles to the Charts are purposely drawn to shew these kinds of irregularities either at the circumference or in the bodies of the storms. If considered attentively the reader will see that the arrows may curve more inwards or outwards, or be in the exact circumference of every circle, from a hundred varying causes and forces.

† Here we have an explanation of this treacherous moderating of the weather which I have often remarked upon, see "Horn Book of Storms," p. 11, and which every seaman of experience in tropical seas knows.

wind at from between South to S. S. W. and S. W. those which had it steadiest and were furthest to the Eastward, i. e. nearest to the centre, which are the Ainslie and Ugie, having it between South and S. S. W. so that we may call it almost S. b. W. on the average, which would give the centre bearing at noon E. b S., from the centre of the triangle formed by them, at any distance we may suppose; but it is barely possible to assign this, as we know nothing of the general sizes of the vortices in the Southern hemisphere or of this one in particular. We may notice also that to this day the two ships Edmonstone and Sophia which were, though in about the same Lat. three or four degrees to the West of the others, had nothing but variable light breezes, and fine weather.

On the 26th November.—We have still the same four ships near each other, though somewhat more dispersed; two, the Futtle Rozack and Ainslie, being at 73 miles from each other and the other two about midway between them, the whole four had severe gales and by noon, the Fleming was lying to under storm stay sails; the Ugie under bare poles at 4 P. M. and the Ainslie also hove to at noon. These three ships had the wind between W. S. W. and S. W. The Futtle Rozack, the northernmost ship, having it about S. W. at noon, though as she was running away to the S. E. b. E. she found it drawing more Westerly. Taking a spot in the middle of the acute rhomboid formed by their four positions,* which will only differ 35 miles at farthest from the two most distant from each other, and this in the line of the perpendicular, we shall find it to be in Lat. 6° 5′ S. Long. 86° 30′ E. and if we take it that here the average wind was really S. W. b. W. $\frac{1}{2}$ W. we shall have the centre bearing from us S. E. b S. $\frac{1}{2}$ S. and we may perhaps assume that the distance of it did not exceed from this spot 150 miles, which would place it as I have marked it in Lat. 8° 17′ S., Long. 87° 45′ E. It was not *much* more than this distance, for the Sophia and Edmonstone which were about 220 miles due West of these four ships, had still fine weather with a brisk S. S. W. and Southerly breeze at noon in this day and the Baboo, as nearly as we

* This, when the positions of vessels do not afford cross bearings by the perpendiculars from their tangents is far the safest and must be the most correct method, particularly if we take into account how ill the exact positions can be ascertained in such weather and with how little exactitude the direction of the wind also is noted in most logs.

can judge from her Lat. and Long. was in Long. 83° 40′ E. Lat. 6° 17′ South or about 180 miles also to the Westward, standing close hauled 4½ knots to the S. E. b S. with the wind at S. W. b S. but with only squally and rainy weather, whereas had the storm been of much larger dimensions, that is if its centre was at any much greater distance from the mean point between the four ships already noted above, the Baboo must now have felt it more severely. Hence 150 miles is certainly the utmost semi-diameter we can allow to the storm on this day, supposing the circle to be fully formed.

27*th November.*—The positions, of the same four ships, again form a triangular figure, of which the longest diameter from W. S. W. to E. N. E. is 75 miles and the perpendicular about 20. Three of them indeed, the Fleming, Ainslie, and Futtle Rozack are so placed that their mean distance is but about 18 miles, and I take this spot, Lat. 6° 32′ S. Long. 87° 13′ E. to be the *average position* of those three ships. Their winds as marked in the logs are ;

Elizabeth Ainslie about N. W. b W.
Fleming about W. N. W.
Futtle Rozack N. W.

N. W. b. W. is thus about the mean of their winds and the Ugie we find had it W. N. W. Projecting these for the supposed bearing of the centre S. W. b S. and S. S. W. it will give us two *diverging* lines, not an unfrequent case where ships are near each other, the weather severe, and the wind not probably " filled up," (if marked at all in the log) till a day or two afterwards.* To the Westward we have the Edmonstone and Baboo with apparently *streams* of winds from the South and S. S. W. and a sea from S. E. such as might be expected on the Western verge of a gale, and exactly analogous to those experienced by the Ainslie, Ugie, and other ships on the 25th when on its Northern verge; and those ships Edmonstone, and Baboo, were also standing on the starboard tack to the E. S. E, so as to run towards it. The Sophia, a degree farther to the Westward, has the S. E. swell but less wind.

* This is no exaggeration, as every one who knows what the severe and anxious duties of the master and officers of a merchant ship, under the present economical systems of sailing them, become in bad weather will fully admit; and we must add here that most of our ships had Lascar crews and Coolies on board. I do not then it will be understood, make the remark in the text disparagingly, but as necessary to put the reader in full possession of the facts and the grounds of my judgment.

We must therefore, as the gale had not yet reached the Baboo, which ship is the nearest, and at about 150 miles from the Futtle Rozack, Ainslie, and Fleming, conclude that it did not much exceed 100 miles in its semi-diameter, and taking this distance on each bearing line and then the mean point between the two, we obtain a spot in Lat. 7° 50′ S. Long. 86° 52′ E. for the *approximate* place of the centre of our storm for the 27th, but we shall find on the 28th that this very nearly approaches what *must* have been its true place as shewn by the veering of the winds, as the ships running and drifting to the S. S. E. *sailed close round* the centre, which was slowly moving to the N. W.

On the 28th of November.—We find on this day three of our ships the Fleming, Futtle Rozack, and Ainslie, nearly on the same meridian, but with a difference of 75 miles in Lat. between the Fleming, the northernmost and the Ainslie the southernmost ship, all having run or drifted, as the wind veered with them, to between the S. S. East and S. b. Westward, and the hurricane having been stationary or passed very slowly to the N. Westward, judging from its approximate track already laid down. Now *if* the circular theory be true, and if there *was* this progressive motion we ought to find that these ships have brought the winds from N. N. W. to North and N. East, according to their positions on various parts of the circle, having run or drifted, as before said, round the N. Eastern and Eastern, and one of them, the Ainslie, reached the S. Eastern quadrant of the storm circle. We have accordingly at noon.

The *Fleming* with the wind. { *More moderate* and drawing to the N. W.* P. M. N. N. W. and as the ship was running to the S. W. at 8 P. M. N. East.

The *Futtle Rozack.* .. ... { Wind N. E. throughout, having veered from North with tremendous sea, her course nearly parallel to the track of the storm.

The *Ainslie.* .. .. .. { N. E. hard gale, tremendous sea P. M. E. N. E. 6 P. M. East.

While the *Ugie* from 80 to 90 miles to the Eastward of these ships has the gale first from N. N. W. but by running to the S. W. b S. brings it to North: all this is, as will readily be comprehended in exact con-

* I suppose it to be about N. W. b. N.

formity with our law of storms for the Southern Hemisphere ; and to the Westward we have now moreover.

The *Baboo*. .. .. { With wind from S. to S. W. and at noon S. W. b W. and at 6 P. M. W. S. W. strong gale.

The *Edmonstone*. .. .. { With strong gale and mountainous sea wind about S. S. W. veering to S.W. after noon.

which are also about the winds which ships entering the storm on its western quadrant should have. The Sophia is yet too far to the Westward to feel much of the storm. Taking all these data we find that the nearest spot which will reconcile them, within either a few miles of their position as given or calculated, or within a point or more of the direction of the wind,* is one in Lat. 7° 18′ S. and 86° 45′ E. where I have therefore placed the *approximate* centre of the storm for this day.

On the 29*th* N*ovember*.—The positions of the ships are now becoming, it should be recollected, very uncertain from the continuance of the bad weather, and thus any estimation of the true place of the centre of the storm from their supposed places at noon, becomes more and more difficult. Nevertheless if we take a point near the calculated place

* I use here these words, intentionally, and as writing for unprofessional as well as professional men, and anxious that not only all our data, but also all the *considerations* which would influence the mind of a scientific seaman in considering what weight he would give to these data, should be known to all. It occurs to me that I may usefully set down here, what considerations must be taken into account in considering log-book relations of storms. The seaman is acquainted with most of them, but some may be new even to him. The data are first the ship's place, second the direction of the wind, third the run or drift, fourth the sea, these are influenced by,

1 Want of observations.

2 Bad observations set down as good ones.

3 Run or drift ill kept or badly estimated, few ships marking their lee-way for instance, and some being much more lee-wardly than others.

4 Storm wave, } See 8th Memoir, Jour. As. Soc. Vol. XII. p. 397 for the ex-
5 Storm current, } planation of these terms.

6 Wind carefully or carelessly noted ?

7 Not noted at all till a day or two after the storm ?

8 Veering of the wind set down at the wrong hours.

9 Alterations of courses also set down wrong, or at wrong time.

10 Inaccuracy of all data from errors of copyists or printers ; the last almost continual in Newspaper accounts.

of the Elizabeth Ainslie which ship must have been close to the centre at noon, for she was *in* it at 5 P. M. on this day, we shall find, that it agrees so far as to make the following ships have the winds by the chart and by their logs as follows:—

	Wind by Log.	*Wind by the projection.*
Elizabeth Ainslie, ..	about North. ..	Assumed correct.
John Fleming, ..	between N. and E.	N. ½ E.
Flowers of Ugie, ..	about N. b E.	N. ½ E.
Futtle Rozack, ..	N. East. ..	N. N. E. ½ E.
Baboo, ...	Westerly. ..	W. by N.
Edmonstone, ..	West.	West.
Sophia, ...	about W. S. W.	S. W. by S.

which is near enough for these seven ships to allow us to assume it. It will then be for this day in Lat. 8° 38′ S. Long. 85° 00 E.

On the 30th November.—We find that a number of the ships which had drifted or run to the South and South Westward, were evidently on the Eastern and South Eastern and Southern quadrants of the storm, having the winds from N. by E. to N. E. and East, while others were on the Northern, and the Sophia on the extreme North Western verge. The Edmonstone which ship had run down about a degree and a half to the Southward, (S. S. E. South and S. S. W.) had the wind also veering as it *should* veer with a Hurricane slowly progressing to the Westward, while she was running partly round the N. Eastern, and towards the Eastern quadrants of it; and her Bar. also was falling from midnight of the 29th to 30th, as by bearing up, she run down again towards, and neared the centre. We find it again rising also when, having brought the centre of the Hurricane to bear W. b N. of her (wind N. b E.) towards midnight of the 1st December, she again heaves to and allowed the storm to pass slowly away from her, while she drifted away from *it*. The following will be found the directions of the wind as given in the ship's logs and those which the centre of the Hurricane, as assumed* for this day, and the positions of the ships give at Noon.

* I use this word "assumed" rather in contradistinction to "shown" or "demonstrated" because of the great uncertainty of many of the ships' positions, of which some have now been three or four days without observations and keeping a very indifferent note of the drift, sea, and even of courses, and winds.

	Wind by the Log.	*Winds by their positions on the chart.*
Edmonstone,	N. N. W.	N. N. W.
Flowers of Ugie,	N. E.	N. E.
Futtle Rozack,	N. E.	N. E.
Active,*	about East	E. N. E.
Baboo,	N. W.	N. b. W.
Wellington,	E. S. E.	E. $\frac{3}{4}$ S.

The Ainslie and John Fleming's positions are both utterly uncertain on this day, though both ships were doubtless from the violence and veerings of the wind with them, close to the centre; no sort of account indeed could well be kept in these ships as from stress of weather, they were obliged to steer various courses so as to ease the vessel as much as possible, on account of their cooley passengers. The Ward from the inperfect newspaper account appears, though a degree or more to the North of the Wellington, to have had it at S. W. commencing on this day, though her position is quite uncertain,† as the Lat. and Long. given, as in the case of the Active, seem to have been intended to express the spot where they had the heaviest weather and not the ship's place.

The log of the Sophia offers a considerable anomaly. By the position of our centre from which she is at 180 miles distance, which is much less than the distance of the Wellington, and about the distance of the Futtle Rozack and Ugie from it, she should have the wind at S. W. while she has it at *North* W. by her log! I am unable at present to reconcile this. It may be an error in copying, or it may be that she met with another and a new storm thrown off in advance of the principal one, or finally she may have been carried much further to the Eastward than she supposed, and thus have been really on the N. Eastern quadrant as her wind would place her. I leave it therefore for the present.

* This vessel's place is also uncertain, for the Lat. and Long. given in the newspaper appear to be that of the ship when the storm was at its height, rather than that of a given date.

† The position is wholly wrong. The Ward spoke the Sophia on the 26th in 6½ S. and therefore could not be on the 30th in 12. 30, So, both having Southerly winds. She was probably on this day somewhere between the Sophia's and Baboo's tracks which would give her the S. Westerly gale mentioned.

On the 1st December.—We have the Flowers of Ugie and Futtle Rozack close together with a heavy gale at N. E., and the Edmonstone also, which ship had run to the Southward about 150 miles, making but little westing, was now nearly on the same parallel, but 90 miles to the Westward of the two former ships, also with a N. Easterly gale. This places all three ships *on the S. E. quadrant* of the storm circle; and we have the Fleming with a hurricane between North and East " and the Ainslie with puffs and lulls from the N. E.," indicating that both were not far from the centre and also on the same quadrant. The Fleming appears to have run in company with the storm for some time, and as the Ainslie was hove to, we see by her rising Bar. that it was, by her drift, rapidly passing from her. The track laid down for these two vessels it will be remembered is merely *a line to join the two points* between the 29th November, and 2nd and 3rd December, their position being wholly uncertain between those dates. The Baboo and Sophia both mark winds at N. W. but the positions of both are very uncertain. Hence we may I think place the centre of the storm for this day about in Lat. 9° 35′ S. and Long. 83° 42′ E. and it will give the winds to the ships as follows:—

Ugie and Futtle Rozack about, ..	N. E. by E.
Ainslie and Fleming's positions wholly uncertain, ...	N. Eastward.
Edmonstone, ...	E. N. E.
Wellington, ...	East.

which with the exception of the Edmonstone is not far from what they had. For the position of the Baboo, we have only her Lat. which however would undoubtedly place her on the N. E. quadrant and therefore give her a North Westerly wind. The Sophia (or her position) is an anomaly which I must leave as I find it. She has by the position given, and with our centre, the wind a little to Southward of West, but by her log as marked she had a heavy *North* Westerly gale, she may have again been farther to the Eastward than she supposed for she could have had no good observations for the preceding 3 days, and this as before remarked would place her on the right quadrant of the circle for a N.Westerly gale, I have however, marked a storm arrow through her supposed position for this day.

On the 2nd December.—We have the Futtle Rozack, Edmonstone,

Ainslie, and Fleming, all not far from the same parallel of Lat. but dispersed over four degrees of Long. The Fleming (position uncertain) being the Westernmost, and Futtle Rozack farthest to the E. We have the Ugie also about a degree to the Southward of them, and the weather is fair, or clearing up fast with a fair Easterly breeze, for all these ships by noon on this day, as being on the S. E. quadrant of the storm, had run or drifted out of it; and had no doubt now a part of the usual trade wind. The Sophia is found on this day in about the Lat. of the centre of the 1st, and she has the wind at North, at noon, *from a heavy gale at N. W.* on the preceding days, shewing evidently that her storm could not have been the same as the one we have been considering, *i. e.* that of the Futtle Rozack, Ugie and and other ships. She notes also, that at midnight between the 1st and 2nd there was a heavy sea coming up from S. W. which was in all probability the sea from the Ugie's storm, to judge by the positions of our circles.

PART II.

Storms in the Northern Hemisphere.

25*th November.*—In the Northern Hemisphere we have nothing extraordinary for this day, the Carena off Ceylon having light airs and the Winifred in the middle of the bay in Lat. 13° a fresh monsoon with an average Bar.

26*th November.*—The Winifred, Candahar, and Fyzul Curreem, have winds and weather indicating a change, though there is nothing sufficiently pronounced to be called, as yet, the commencement of a storm, and the Bars. of both the Candahar and Winifred are high.

27*th November.*—We have three ships, the Winifred, Fyzulbarry and Fyzul Curreem, each with signs of the approaching storm, which was afterwards so severe with the Fyzulbarry, (and perhaps the *Colonel Burney?*) The Winifred in Lat. 7° 4′ N. and Long. 85° 56′ E. at noon is running rapidly to the South, the wind veering from E. N. E. at noon to North at 8 P. M., and N. N. W. at 4 A. M. with thick gloomy weather and violent squalls, "giving little warning" says Captain Webb; an apt phrase to designate squalls *thrown off* from the periphery of a rotatory storm, if they were such.

The Fyzul Curreem in Lat. 5° 11′ S., but in Long. 83° 36′ E., or two degrees farther to the Westward has squally weather from N. N. W. and the Fyzulbarry in Lat. 5° 38′ and in 88.° 40′ East, has it threatening from the Eastward with a heavy N. E. sea, her Bar. falling, and P. M. the wind increasing to a gale from E. N. E. with a heavy sea. We may thus assume that with this ship, at midnight, a storm had fairly begun from N. E., at which we find it marked at 1 A. M. on the morning of the 28th; at what distance we have no means of judging. I have therefore for this day marked but a single segment of a circle through the Fyzulbarry's position, from a centre 240 miles due S. E. of it, which is to be taken rather as an *indication* of the storm than any thing else.

On the 28th November.—We have the Winifred in 4° 27′ N. and Fyzul Curreem in 2° 06′ N. the first with "strong gales N. W. and N. N. W. and gloomy weather with her Bar. falling a little, and the latter with only a fresh breeze from about N. W. The Fyzulbarry had her N. Easterly storm continuing and veering to E. N. E. It is probable that as the Winifred and Fyzulbarry were only 220 miles apart on this day, the Winifred was just on the outskirts of the storm which evidently lies betwixt them; and as she was running to the Southward she soon got clear of it. The Fyzul Curreem was wholly out of its influence and the Candahar has, as yet, but a strong monsoon gale. I have therefore placed the centre of the Fyzulbarry's storm in Lat. 6° 00′ N. Long. 88° 45′ E. marking an arrow through the Winifred's position to shew its effect upon her.

29th November.—We have the Candahar with an evidently *commencing* gale at N. E. and the Fyzulbarry with a furious one at N. E. We have no other bearing or datum whereby to estimate the distance of the centre of this storm which now bore about S. E. from the Fyzulbarry, but we find that it veered rapidly with her to N. N. E. and by 11: 30 P. M. to North; of course as the vessel ran and drifted round the N. W. quadrant. From the best estimate I can make, I should with every allowance place the centre, which bore at noon S. E. of this ship, in Lat. 6° 52′ N. Long. 87° 48′ E.* We have no Lat. of the Carena, and of the Bittern *only* a Lat. of this day!

* It was really in about 6° 00′ N., Long. 88° 00′ East, by the Log of the John Brightman. See note at the end.

I have printed the abridgment of these extracts, indeed, almost to shew what meagre and disappointing documents we sometimes obtain.* We cannot from such data affirm that the Fyzulbarry's and Candahar's storms were the same, and indeed the great size of this circle is entirely I think against the probability that they were, for it would be if completed 600 miles in diameter, and we shall find on the 30th and 1st December that the storm *could* not have been the same, and we thus obtain distinct evidence of three separate storms at the same time; two in the Northern and one in the Southern Hemisphere.

30*th November.*—We have first the Fyzulbarry running to the S. S. E. and S. E. and evidently towards the centre of the storm, which does not appear to have been an entirely calm one or at least the ship did not get into it. At 7 P. M. she had the Westerly sea, "rolling up and overpowering the Easterly one," and the S. W. and Southerly gale coming up. She had an observation, though indifferent on this-day, so that we may take her position as within a little to be that of the centre of the storm, and projecting it would give to Candahar a N. *Easterly* gale at 250 miles distance from the centre; and therefore a moderate, instead of a furious N. *Westerly* one which she had,) shewing that her storm as before remarked, was certainly a different one from that of the Fyzulbarry. I have then placed the centre of the Fyzulbarry's storm for this day in Lat. 7° 30′ N. Long. 87° 30′. E. The Mary Imrie in 12°20′ North, though we have not her longitude this day, was doubtless on the N. W. quadrant of the Candahar's storm, and at Madras the high surf and strong current to the Northward are indications of the approaching tempest there. The Vernon we find went to sea, on this day from Madras roads, with a fresh N. N. E. gale at 7 P. M. The Bittern and Carena's logs give us no information for want of Long. but the Winifred's is interesting as showing that though the

* And, as it has often struck me, to remark on the absurd practice of keeping a log book without entering the Longitude. It is quite possible that a case might arise in which, at least ignorance of his position, if not of wilful destruction of his vessel might be alledged, if not proved, in a court of law against the master of a vessel through this omission; and his insurance thereby become vitiated in case of an accident. The private "Chronometer book" of a Captain would barely be called a legitimate document when the book which *should* contain the vessel's place at noon is blank.

centre of the Fyzulbarry's storm and that of the ships in the Southern Hemisphere were sixteen degrees of Lat. apart on this day, there was still about the equator considerable atmospheric disturbance, with heavy streams of wind from the Westward, agreeing with what we should look for as the general effect of the Southern and Northern halves of the storms in each Hemisphere. The Winifred's Bar. also, and it was evidently most carefully observed, is yet about two tenths below the averages before and after the bad weather which she expe-perienced. At *midnight* of this day we have the Candahar with a heavy gale at N. W. and the Mary Imrie with a terrific one at N. N. E. and taking the last ship to have made about a South course, we find by projection that on the 30th, *at midnight* the centre of what I shall now on this evidence call the Candahar's storm was in about Lat. 10° 45′ N., Long. 65° 0′ East, the centre passing near the Candahar about noon the following day; the Mary Imrie scudding to the Southward on its Western side.

1*st December.*—We have first the Fyzulbarry, which ship had run with her Southerly gale 150 miles to the N. N. E. from noon 30th to noon of this day with the winds between S. S. W. and South, raising her Bar. as she increased her distance from the centre of the storm from 29.30, at 7 A. M. to 29.80 at 10 P. M. or half an inch in fifteen hours; and obtaining also moderate weather at midnight. I have before shewn on the 29th and 30th November that this ship's storm must have been a separate one from that of the Candahar, and it will be presently seen that it clearly was so. The loose report of the Niagara informs us of nothing more than that she had a rotatory storm *about* in Lat. 10° Long. 87° of which we may suppose the strength was *about* noon on this day, and that she was not far from the centre of it; drifting or running round the S. Eastern and North Eastern quadrants of it, if indeed the expressions used do not mean that she had a shift of wind; she would then at all events, if not in the centre, be on the Eastern side of it; so that taking the Fyzulbarry's and this to be the same storm we find that it may have travelled up to the N. b. Westward about 150 miles, or something less, in this 24 hours, and to this the run of the Fyzulbarry 150 miles to the N. b. E. *but carrying always a Southerly wind*, lends much probability. However the Niagara's position and times of the wind, &c. are so loosely given

that we can only mark this as an approximation. Her rapid change of wind, however, and her distance from the Candahar on this day, which was nearly, or quite, three degrees of Long. exclude the idea of its being the same storm, and I have placed its centre, approximately, close to the Niagara in Lat. 9° 55′ N. Long. 86° 55′ E.

We now come to the Candahar, Mary Imrie and Vernon on this day, and here we must first remark on the Candahar's position which must be I should think erroneously given,* for she was lying to with a tremendous heavy gale from *North Westward* veering at one time to N. by E. and again to N. W. by W. and yet she has made nearly a Northerly course! This is of course impossible, unless we suppose her to have been carried as far to the West by the storm wave as she was drifted to the East by the wind and storm current, both of which tended to carry her to the East and E. S. E. and her position indeed on this day can but be an estimated one: I did not observe this at the time I made the extract, and there may be some clerical error of my own. It is now too late to rectify it, and we must therefore allow that one way or the other there is an error between these two days. The Vernon's position was certainly correct but then she had only a "strong breeze" with her Barometer at 29.68. and we cannot thus allow her to have been *in* the storm though close to the outskirts of it. The Mary Imrie was running free and had an observation, so that her position may be taken as nearly correct, but we have unfortunately the wind but loosely given as veering "to the *Westward*" (from the N. N. E.) after noon. We may guess it to have been about North or to the Westward of it, *at* Noon which placing the Candahar, somewhat further to the Eastward, if we please, will give us a spot in about Lat. 10° 18′ Long. 84° 2′ E. as the approximate position of the centre of this storm on this day which was evidently passing the meridian of these ships and close to the Candahar, and this apparently on a track to the Southward of West.

The difference of their positions indeed is but 28 miles, an error which might easily occur with the Candahar, having no observation. The repeated shifts of wind from N. W. to S. W. may be accounted for very simply, by reflecting that when near to or in the central space, there are many causes such as irregular blasts, storm wave and cur-

* Or that of the day preceding may be so ?

rent,—the ship's own run or drift &c.—to induce these irregularities; and we find that as the centre passed on and she fell into the S. Eastern quadrant of the storm, she again experienced it blowing a hurricane from S. W. shewing that (as she had run a little to the North) she had been on the Southern side of the central space; of whatever extent this was. It is indeed I think most probable that on this day she was not to the Northward but the *Southward* of the Mary Imrie's position. Both ships were probably very near to, though they did not see each other. The Vernon's position gives a radius of 110 miles, or a diameter of 220, for this storm for this day, and we are satisfied that it could not be the Niagara's or Fyzulbarry's, the Niagara being evidently close to the centre of hers. I shall remark on the 2nd, on the Madras and Ceylon reports for this and the next day.

On the 2nd December.—We find that the Mary Imrie on this day while running down say about 80 miles* to the South and South Eastward, before a terrific hurricane veering from the N.N.E. to the N. Westward, had her Bar. always falling, and was at 2 A. M. in another, and of course a *different* centre from that of the Candahar's storm of the day proceding, for she was now perhaps 100 miles from that ship, This centre gave her another hurricane *at S. S. W.* and Capt. Boyd's description of the sea is exactly what we should suppose the effect of a second storm passing over any part of the sea left by one just preceding it to be. I think it most probable that this second hurricane may have been the Niagara and Fyzulbarry's storm and have so marked it; supposing the Mary Imrie to have been in Lat. 9° 20′ and Long. 85° 00′ and the centre a little to the Westward of her.

The Candahar, on this day had run to the North and N. W. round the Eastern and North Eastern quadrants of her storm, while the Vernon, which ship had stood to the E. S. E. with the N. Easterly gale of the preceding day, had a smart shift of wind of four points, as the centre approached her, and a fall of 0.14 in her Bar. As the storm however passed to the South of her, and she was bound to the Northward, she was soon out of its influence. We find also on this day that a Westerly and N. Westerly storm prevailed at the stations on the North end of Ceylon. To obviate confusion, I have preferred consi-

* We must take this by guess having no log of the distance.

dering the reports from Madras and Ceylon, for the 1st and 2d together.

First, in reference to the general effects of the storm on the Coast: we shall observe on inspecting the chart, that there are at least two storms on this day, the Mary Imrie, Niagara and Fyzulbarry's being one, and the Candahar's another, travelling up on a N. Westerly course more or less curving, apparently to the Westward, as they approach each other,* and this bending by the way is a very remarkable feature. The average distance of the centres of the two storms from the coast we may call about $3\frac{1}{2}$ degrees. The *Candahar's* storm we know to have been of very small extent (taking her position on this day as correct) as it is determined by the *Vernon's* which is certainly exact within the trifling distance arising from the defects of all observations in bad weather. The Mary Imrie's storm we have admitted to be the Niagara's on this day, and we shall find that this projected will bring the *circumference* of her storm to within two degrees of the North end of Ceylon, and that the joint effect of both vorticæ would be to create a Northerly, and N. Westerly wind, stream, or gale if their influence extended so far; and they ought moreover to create a Northerly and N. Easterly stream at Madras. Now we know that at Madras which is as far to the N. W. as Kayto and Paumbum are to the West, and W. S. W. of the centres of the 1st and 2d, there were also the indications of an approaching storm in the increasing surf and slight fall of the Bar.† as well as the *North* current, (see remarks on Capt. Biden's report,) and that the wind was from the North and North East on the 2d, and to 4 A. M. on the 3rd, changing afterwards to S. E. From the effects of the ranges of hills (and even mountains) between Madras and the north end of Ceylon, it is impossible to go farther than to indicate generally what the average effects of a storm would be, as every separate spur and range would produce necessarily some local effect. On the coast we have the effects of the storm current in the "North current," and we have finally within these three days:——

* The Colonel Burney's storm *may* have been a third for anything we know, and it may be to it, that the Logs of the Carena and Bittern relate.

† I should consider this *slight* fall of the Bar. as some evidence in favor of the relation of the two storms and their bending to the Westward which I have supposed.

1st, 2d and 3rd Nov.—The Bar. first falling, then about stationary, and lastly rising again to its former level as if it had just felt the storm, but no more. The indications at Ceylon on the 2d are clearly those of a storm passing over the South extremity of the Peninsula, and probably, if we had any reports from Tranquebar or between it, and point Calymere we shall find that there really was a *shift* thereabouts, while the rapid veering at the station of Paumbum was taking place. It is possible that the tendency of the whole acrial impulse, like a storm or tide wave, was as usual, to force its way through the Paulgatcherry pass, as shewn in my eighth Memoir.

I must not conclude this part of the summary without noticing the remarkable fact of the Mary Imric's Bar. remaining so high, though fluctuating greatly, in the first storm; and in the second falling to 29° 25. It will be noticed and for the present I should suppose this is the cause of this anomaly, that she was at the time her Bar. stood so high, in the N. West quadrant (having the wind at N. N. E.) of her first storm, and she had thus both the effect of the verge of the coming storm which sometimes and perhaps always, raises the Bar.* and also that of the monsoon from the N. Eastern part of the Bay. The Ariel's storm in my sixth Memoir, Vol. p. 686 of Journal is another instance in which this seems to have occurred with two storms coming up in different directions and both at a considerable angle to the monsoon. We find from the Vernon's log that it *was* blowing a fresh monsoon from the N. N. E. on this day. The oscillation I have frequently remarked upon, and if Capt. Boyd had had a Sympiesometer on board, no doubt the warning would have been still more distinctly given.

Extract from the Log of the Ship EMILY, *Captain* ANDERSON *from Shields to Calcutta, reduced to Civil Time.*

The following log reached me after the chart was lithographed; it will be seen by it that the Emily was skirting the Fyzulbarry's storm to the Eastward on the 27th and 28th, as the Winifred was to the Westward. From the heights of the Emily's Bar. we may infer that she had really no part of the vortex but rather a heavy monsoon

* See Col. Reid quoting Mr. Redfield's explanation of this phœnomenon. Second edition p. 514 to 519.

setting in, though on the 27th she is near enough to the Fyzulbarry's place to allow us to suppose that both were partaking of the strong Easterly stream of wind which prevailed thereabouts on that day.

The Emily was on the 6th November 1843, at noon, in Lat. 3°.40 N. Long. 91° .34′ (to 54′ by Lunars) East. Bar. 30.5 Ther. 85°, standing to the N. N. E. with variable N. N. W. to N. W, and N. Easterly breezes to midnight.

27*th November.*—Increasing breeze N. E. b. E. to noon, when Lat. 5° 28. Long. 91° 46′ and 92° 6′* Bar. 30.5 Ther. 83°. P. M, strong breeze East and sudden squalls. Ship standing 6 and 7 knots to the N. N. W. and N. ½ W. Midnight the same, and increasing with incessant rain.

28*th November.*—A. M. Thick cloudy weather, continued rain and heavy squalls. Wind 2 A. M. E. S. E. ; at 6 East. Noon Lat. Obs. 7° 42′ N., Long. 91° 38′ E. Bar. 30.5 Ther. 81°. P. M. Increasing breeze and a high confused sea, wind E. b. N. Midnight heavy squalls.

29*th November.*—A. M. strong gales East with tremendous squalls and a continuance of heavy rain, 8 A. M. wind N. E. b. E. Noon Lat. Obs. 10° 17′ Long. 91° 3′ †91° 40′ by 8 P. M. finer; out all reefs. Wind N. E. b. E. and N. E.

30*th November.*—Increasing again from the N. E., noon Lat. 14° 13′ N. Long. 89° 40′ E. Bar. 70.00 Ther. 83°. P. M. hard gales East to N. E. with tremendous heavy squalls and a high confused sea. Midnight, wind E. b. N. more moderate.

1*st December.*—A. M. Variable weather with squalls, wind about E. N. E. Lat. 14° 13′ N., Long. 89 °44′ Bar. 30.10. Ther. 83° P. M. squally and torrents of rain. Wind about E. N, E.

2*d December*—Moderate from N. E. Lat. 15° 35′ N. Long. 89° 22′ E.

Concluding Remarks.

One of the first peculiarities which strikes us in considering the storm in the Southern Hemisphere, is its almost stationary character,

* The several Longs. apparently Lunar brought on by Chr.

† 91° 30′ is probably meant here, giving a mean Long. of 91° 35′ for the ship's place.

as compared with the storms we have been accustomed to consider. We find it moving only,

	Miles.
From the 26th to the 27th Nov.	60
27th ,, 28th ,,	32
28th ,, 29th ,,	135
29th ,, 30th ,,	47
30th ,, 1st Dec.	57
Or in five days, ...	331
Giving an average of per *Day*, ..	$66\frac{1}{5}$
Or per *hour* not more than	$2\frac{3}{4}$

and this also on a singularly curved track.* This slow motion of the storms here, if future researches should show it to be usual, will be a new and curious fact, and will explain, not the frequency of their occurrence hereabouts, but the frequency of their being met with in the track of the outward-bound ships and on the verge of the trade.†

With respect to the track itself; we have, I think clearly established that it must first have moved up from the S. E. to the N. Westward and then curved away to the S. W. The exact position of the ships, is of course liable to great errors after three, four, or five days of bad weather or hurricane; but still these errors are reducible to moderate limits, and when we have ships on both sides of the storm, or ships on one side and others at or close to the centres, we are very sure that our positions for these points from day to day cannot be very far wrong; and certainly not far enough to invalidate our general conclusion as to the extent of the space passed over by the storm in these five days.‡

There are some other matters worthy of note which I take here

* The true track was in all probality a sharp curve passing near the different points.

† Col. Reid remarks p. 241 that the Albion's storm was apparently almost stationary or forming.

‡ See postcript for an extraordinary confirmation of the truth of our work, and of these remarks, which were written months before the intelligence there given reached me.

in their natural order to direct the attention of future observers to them, and these are:——

Atmospheric signs indicating the approach of the storm. The most remarkable of these is the warning noise noticed by Captain Rundle p. 32, to which I have there appended a note referring also to Journal Vol. XI. p. 1000 for another instance where it was carefully noted, and I have heard it also on other occasions; though not noting it on the spot I will not refer more particularly to them. It is exactly that sort of noise which we hear, and read of, in old houses in England, and with which most of us are acquainted; but we there attribute it to the noise of the wind in the chimneys, or amongst the trees, or, on board a ship to the rigging: yet here there can be no doubt of its being distinctly heard at sea as the "roaring and screaming" of the wind in a tyfoon or hurricane certainly is. My *present* theory to account for it is this. I suppose the storm to be really formed and to be "roaring and screaming" at say 200 miles' distance, and that the noise, if not conveyed directly by the wind, may be so reflectively from the clouds, as in the case of thunder claps. A noise is known on some parts of the coast of England by the name of "the calling of the sea" as occurring in fine weather and announcing a storm, and also in mountainous countries. All these may be connected, and seamen may render great service to science and to themselves by noting these curious phœnomenæ.

The sickly and dancing appearances of the stars, as noticed by Captain Rundle is also remarkable but more easily explained, as we may suppose the sickly (hazy) appearance to have arisen from the atmosphere being loaded with vapour half condensed, and the "dancing" to be occasioned by their appearing at times through spaces and intervals somewhat less loaded with vapour wreaths. If I am not mistaken the fixed light of a Light House has sometimes this dancing motion, by the effect of small wreaths of vapour passing before it, as at the breaking up of a fog? The vibrating appearance of distant objects seen through a telescope in the morning in tropical climates and owing to the different rarefactions of strata of air is familiar to us all.

Phosphoric flashes in the water, are common enough in fine weather, but are nevertheless well worth noting; we do not yet know

if more common in particular parts of the ocean, or at particular seasons, or in particular weather than at others.

The appearances of the clouds are of special interest, for there can be no doubt that many indications can be drawn from them of great value, both to the careful mariner and to the man of science. The remark of Captain Handley p. 14, shows the storm was forming to the eastward of him, and those of Captain Rundle, both as to appearance and motions are exceedingly interesting, as showing that there were different currents prevailing above, probably from one part of the storm or vortex over-reaching another.

The kind of lightning described by Captain Rundle, pis also worthy of great attention: should this be found always to precede these storms in particular latitudes it would be, in addition to other signs, of great utility.*

The states of the Barometers and Sympiesometers of the various ships both as relates to the approach of the storm, and to the manner in which the instruments were affected every time the ships bore up, and, tempted no doubt by the fair winds, ran down to the S. Westward and thus neared the centre, is of peculiar interest; and it is highly worthy of remark that not one of them thought *of running to the E. N. E. or even N. E.* while the wind and sea admitted of it, which was the true course to steer, as may be seen by the chart and storm card. They would thus have raised their Barometers and should have then hauled gradually to the Southward, and South-westward, and so have *sailed round*, and eventually out of it. In this point of view the logs of the Fleming, Ainslie, Futtle Rozack, and Flowers of Ugie are remarkable, and most instructive lessons for us. These ships will almost indeed, to the eye of the studious seaman, appear to be manœuvring for the purpose of proving the value, the truth,—and I will add the beauty,— of the Law of Storms.

* I have found, while correcting this page, in the press a single instance in which this remarkable kind of lightning is described. It occurs in one of the replies to a circular addressed at my suggestion by the Hon'ble the Court of Directors E. I. C. to their retired Officers, requesting information on storms in the Indian Ocean and China seas, by Captain Jenkins, then commanding the H. C. Ship City of London: who says, speaking of an approaching hurricane in March 1816, in Lat. 12° to 18° South Long. 78° to 76′ East, for which, warned by his Bar., he was preparing. "At 7, the appearance of the atmosphere altered, constant vivid lightning, *resembling in the distance the Northern lights* with frequent hard gusts of wind," &c. We are not to suppose from its being so unfrequently noticed that it is therefore of unusual occurrence; seamen are so accustomed to lightning that they rarely take the trouble to describe it.

In the Northern Hemisphere.

We have principally to remark here on what we may call the "generation of separate storms" at short distances from each other so analogous to what certainly occurred in the Calcutta storm of June 1842, though we might there suppose it to have been occasioned by the influences of the land, as hills, valleys, &c., but it would now appear that the state of the atmosphere which induces one rotatory storm often disposes, or gives rise to, others, just as after certain states of summer weather in Europe, we hear of a succession of thunder storms all over a large tract of country.

Thus we find that when the Fyzulbarry's storm (a true rotatory one) had travelled up from the S. Eastward two or three days, 27th or 28th to the 30th, another storm appears to have commenced at four degrees' distance with the Candahar, which we trace accurately enough through two days as travelling to the W. S. W. and if our conclusions be correct as to the Niagara and Mary Imrie, that the Fyzulbarry's storm when approaching this of the Candahar's, curved away to the W. b. S. This *looks* strange enough, but whatever are the causes of them, the *dust whirlwinds* on the plains of India, of which I have seen as many as four or five at a time, certainly *do* influence (repel) and alter each others tracks. We do not know if these arise from the same cause, but it is the only analogous fact that I am acquainted with,* and the scientific reader will judge from the data set down whether he thinks they are sufficient to entitle us to lay down the tracks which I have here given. There is I think no doubt of the storms being altogether separate ones.

It is remarkable that all these forces and storms seem to have been blended so as to produce one about Palks' Passage, evidently travelling to the Westward also, or rather generated like the other in advance of those raging in the bay, for we find that the Ceylon storms all began on the 1st, when the nearest centre, that of the Candahar's storm was at least at three degrees of distance; and it could not be part of this, for the Vernon's position limits it to the N. W. within a much more circumscribed circle, and I am therefore inclined to believe that at sea as on shore, independent vortexes arise like independent thunder storms.

Postscript.

In the preliminary notice to this Memoir, I announced that I had obtained from the Mauritius the detail of what I may call a beautiful expe-

* "It is possible that one storm may *deflect* another says Col. Reid," p. 433, 2nd Edition of his work.

riment, in which a vessel called the *Charles Heddle* was fully proving for us there, the truth of the researches we were making here. The following is the newspaper notice of it, written by myself, which will fully explain enough of this remarkable, or rather wonderful, fact and coincidence of actual experiments with theory and with resurches going on at thousands of miles distant.

"I have just received from Capt. Royer, the Master Attendant at Mauritius, who, like every one else, was much staggered by the report of the *Charles Heddle's* circular sailings for so many days in a hurricane, a number of logs, and with them her's, which he has taken the trouble to copy himself that there might be no mistake about it, and you will learn with pleasure that I have fortunately just completed a Memoir now printing, of which the evidence leaves no manner of doubt as to the possibility of a fast sailing ship, that could scud well, having really done what the *Charles Heddle* has; and it teaches us moreover, by two perfectly independent storms, at more than a year's distance of time, and in quite different parts of the Southern Indian Ocean, that there are storms of great intensity, lasting for long periods (in both cases five whole days) and which have yet so slow a progressive motion that one might, comparatively speaking, almost term them *stationary* storms. If you like to print this, for it is advantageous now and then to draw attention to the subject, and to show how much yet remains to be learnt, particularly with respect to the storms of the Southern Hemisphere, here are some of the data as briefly as I can give them.

First, from the accompanying chart (of this Memoir) you will see that between the 26th of Nov. and 1st Dec. 1843, and between latitudes 5° 30′ and 11° South and longitudes 83. to 89° East, there was a hurricane raging for the whole five days, which, traced by the logs of many ships, appears only to have travelled in that time, from point to point of its centre, about 255 miles, or allowing for the curves about a degree a day only.

The *Charles Heddle,* by her log now before me, appears to have scudded from the 25th to the 28th February, 1845, for five whole days round and round in a Hurricane circle! during which time she ran upwards of thirteen hundred miles; the wind made with her five complete revolutions, and from calculations derived from the distances and shifts of wind and the positions of the vessel, to have been on an average about 50 miles from its centre; which was slowly moving on, like the one of which I send you the chart, to the southwestward, at not more than three miles an hour; and the direct distance

made by her, from point to point, was but 354 miles. Now, if like the *Charles Heddle*, any of our ships in this November storm had scudded the whole time, they might undoubtedly have made much such a set of circles as you see on my chart, and yet have made but a trifle of direct distance in the whole five days; and in a word we can, so to say, *prove* by this Memoir that there is nothing at all of romance in her account, and that she has been performing for us a very curious and beautiful experiment; as cleverly as if she had been sent out to do it! The investigation of this and the other Mauritius storms for which I have data, will, I doubt not, lead to other equally important and curious facts in that dangerous quarter of which seamen as yet know so little, but the difficulties and trouble of obtaining log books are positively incredible."

The value of this experiment as a proof of the circular theory generally, if it requires any now, and of the truth of our researches I need not dilate upon. In a future Memoir I trust to be able to bring forward a great deal more in relation to the tracks and other peculiarities of the storms of the Southern Hemisphere.

NOTE.—While the last sheets of this Memoir were passing through the press, I obtained by the kindness of Capt. J. Viall, the log of the ship John Brightman, just arrived from the Mauritius, and which ship it will be recollected was seen by the Fyzulbarry on the 28th November, (page 14,) being bound to the Southward. This log, while it corroborates exactly the general direction of the track of the Fyzulbarry's storm, enables us to correct the place of the centre for the 29th, which being laid down from the log of a single ship, without observation, is necessarily subject to error, though here as so frequently before, the error does not amount to much, and all the *relative* data for practical purposes on board either of the ships in the storm, would have been the same: as for the management of a ship, what is required to be known, is the bearing of the centre of the hurricane, and the track of the storm, provided there be ample sea room.

From midnight 27th November.—The John Brightman had heavy squally weather and winds from East to E. S. E., and N. N. E. She was at noon in Lat. 9° 48′ N., Long. 87° 44′ E., Bar. at 29.63. (having been at 29.71. at noon 26th, since which time she had run down South, and S. b. W., 138 miles.) P. M. wind E. b. S., and E. S. E. to midnight, when it was a strong gale with a tremendous cross sea, the vessel having always run to the South and S. b. E. to midnight 56 miles. Bar. 29.58.

28th Nov.—Wind and weather the same, 7 A. M. wind E. N. E., Noon strong gale and high sea, Lat. indifferent Obs. 7.48 N., Long. 87° 48′ E., P. M. wind E. N. E., East, and E. S. E. to midnight when Bar. 29.41. Ship's run from noon between S. S. E. and South 53¾ miles.

29th Nov.—Hard gales, squalls, and sea continuing as before from East, E. S. E., and E. b. N., Noon more moderate, but weather looking very suspicious, Lat. Acct. 6° 03′ N., Long. 87° 58′ East. Bar. 29.30. Ther. 83°. Ship's course from midnight to noon South to S. S. E., 51½ miles, P. M. wind veering from E. b. N. at noon, to N. E. b. N., and N. W. to West, and by 4 P. M. to W. b. S., light variable winds and thick weather. At 2 P. M. breeze increasing, thick unsettled weather, Bar. 29.24. At 4 P. M. fresh gales W. b. S. hove to. At 8 heavy gales and vivid lightning with rain and squalls, Bar. 29.28. Midnight Bar. 29.20.

30th Nov.—A. M. to noon hove to. Bar. rising to 29.36.; at noon Ther. 83°, wind W. S. W. Lat. by indifft. Obs. and Acct. 5° 46′ N., Long. Acct. 88° 31′ East., P. M. Wind S. W. and at 5 P. M. S. S. W., weather moderating. Midnight Bar. 29. 49. Wind South at 5 P. M., and S. S. E. by noon 1st December when Lat. 5° 19′ N., Long. Chr. 90° 16′ E. Ther. 84°, Bar. 29.59.

Proceedings of the Asiatic Society for the month of JANUARY, 1845.

(*And at its supplementary Meeting of 1st February*, 1845.)

The monthly meeting of the Society took place at the usual hour, at the rooms, on Tuesday evening, the 14th January.

The Rev. Dr. Hœberlin, in the Chair.

The following gentlemen, proposed at the last meeting, were ballotted for and declared duly elected.

F. Boutros, Esq. Dehli College; A. Christopher, Esq. La Martiniere; S. B. Bowring, Esq. C. S.; John Ward, Esq. Civil Engineer; E. Blyth, Esq. Associate Member.

And the following new members were proposed: Major Lawrence, Resident, Nepal, proposed by H. Torrens, Esq. seconded by the Sub-Secretary; Rev. Peter Barbé, proposed by H. Torrens, Esq. seconded by the Sub-Secretary.

The Society's Office-bearers for 1844 were unanimously re-elected for 1845, and the following gentlemen were added to their number,—

As Vice-President, Lieut. Col. W. N. Forbes, B. E.

As members of the Committee of Papers,

W. Seton Karr, Esq. C. S.

W. B. O'Shaughnessy, Esq. B. M. S.

On the motion of the Secretary, H. Torrens, Esq. seconded by F. G. T. Heatley, Esq. it was resolved,

That the following gentlemen be requested to act as Corresponding Members of the Committee of Papers,—

V. Tregear, Esq.	A. Sprenger, Esq. M. D.
Captain Boileau, B. E.	G. G. Spilsbury, Esq. M. D.
Lieut. Phayre, B. N. I.	Lieut. Tickell, B. N. I.
Captain Cunningham, B. N. I.	

And that the Committee of Papers be empowered from time to time to add to the foregoing the names of such gentlemen as it may deem likely to assist in its labours.

It was further resolved, that the hour of meeting in future be *half-past seven* instead of half-past eight, P. M.

Read the following list of books.

Books received for the Meeting of the Asiatic Society, Tuesday, January 14, 1845.

Presented.

The Holy Bible in Hindustanee, by Rev. Mr. Long.

The New Testament in Bengalee and English, Matthew to John, by do. do.

Hindustanee Pentateuch, by the Rev. J. Long.
Hindee New Testament, by do. do.
New Testament in Bengalee, by do. do.
Psalms of David in Bengalee, 2 copies, by do. do.
A number of Bengalee tracts, by do. do.
Usher's Works, Vols. II. to XIII. by the Dublin University.
Livius ed. Walker, 7 vols. by do. do.
Wall on the Antient Orthography of the Jews, 3 vols. by do. do.
H. Lloyd's Treatises on Light and Vision, 1 vol. by do. do.
Lectures on the Wave-Theory of Light, 1 vol. by do. do.
B. Lloyd's Mechanical Philosophy, by do. do.
Todd's Discourses on the Prophecies relating to Antichrist, 1 vol. by do. do.
Proceedings of the Irish Archæological Society, by the Society.
Journal of Great Britain and Ireland, No. 13, by the Society.
Proceedings of the Royal Asiatic Society for 1844, by the Society.
Bullétin de la Société de Géographie. Tome 20. Paris, 1843. By the Society.
Journal of the Agricultural and Horticultural Society of India, vol. iii, part iii, by the Society.
Specimen e Litteris Orientalibus, exhibens Taalibii Syntagma. Auct. J. J. Valeton, by the Academy of Leyden.
Edinburgh New Philosophical Journal, No. 73, April to July 1844, by the Editor.
Calcutta Christian Observer, January 1845, by the Editors.
North British Review, No. 1, May 1844, by the Rev. Dr. Wilson.
Akademischer Almanach der Baierischen Akademie der Wissenschaften für das Jahr 1844, by Professor v. Martius.
Oriental Christian Spectator, for December 1844, by the Editor.
Documents et Observations sur le Cours du Bahr el Abiad, par M. D'Armand.
Second Voyage ditto ditto, two copies.
Collection Géographique de la Bibliothèque Royale.
Glossarium Sanscriticum, auct. F. Bopp. Fasciculus II. Berolini, 1844, by the author.

Exchanged.

Journal Asiatique, No. 13, April, 1844.
The Athenæum, Nos. 884—888, 19th Oct. to 2nd Nov. 1844.

Purchased.

Haji Khalfæ Lexicon, 1 vol. printed for the Asiatic Society by the Oriental Translation Fund.
Lettre sur l'utilité des Museés ethnographiques, par Ph. Fr. de Siebold, Paris, 1843.
Journal des Savants, June, 1844.
Philosophical Magazine for July, No. 162. Supplement to D. D. No. 163, and for Aug. 1844, No. 164.
Lardner's Cabinet Cyclopædia, History of Greece, by C. Thirlwall, vol. 8.

It was resolved, that the Society subscribe to the North British Review.

Read the following letter from the Librarian of Trinity College, Dublin :—

To the Vice President of the Asiatic Society of Bengal.

SIR,—I am directed by the Provost and Senior Fellows of Trinity College, Dublin, (in pursuance of the answer which they commissioned the Vice Chancellor of the University of Dublin to make

to your letter to him, dated last September) to forward to you for presentation to the Asiatic Society of Bengal, the works noted on the other side.

I have the honor to be, Sir,
Your obedient servant,
CHARLES WM. WALL,
Librarian.

Trinity College, Dublin, July 8, 1844.

Archbishop Usher's works, edited by Charles R. Ebrington, D. D. Regius, Professor of Divinity in the University of Dublin, Vol. II. to XIII. inclusive (Vol. I. XIV. &c. not yet published)

An examination of the Ancient Orthography of the Jews. By Charles William Wall, Senior Fellow of Trinity College, and Professor of Hebrew in the University of Dublin, Vols. I. II. and III.

Discourses on the Prophecies relating to Antichrist in the writings of Daniel and St. Paul. By James Henthron Todd, M. R. I. A. Fellow of Trinity College, Dublin.

A Treatise on Light and Vision. By the Rev. Humphrey Lloyd, M. A. Fellow of Trinity College, Dublin.

An Elementary Treatise of Mechanical Philosophy. By Bartholomew Lloyd, D. D. Provost of Trinity College, Dublin.

Lectures on the Wave Theory of Light. By the Rev. H. Lloyd, D. D.

Livius, a John Walker, 7 Vols.

Read the following letter from the Librarian:

To H. TORRENS, Esq. *Secretary, Asiatic Society.*

SIR,—I have the honor to submit to you an alphabetical list of the books received during the past year into the Library, together with the account sales of the Oriental publications, and an account of the publications delivered, sold and in store, from the 31st of July 1843, to the 31st of December 1844.

From the alphabetical list it appears, that the number of works received, is nearly the same with that of the preceding year.

I beg, however, to observe, that most of these works bear upon Natural History and Natural Science in general, while a few only are connected with Oriental Researches. Although it is very desirable, that the library of the Asiatic Society should contain standard works on natural sciences, the Oriental division, which is so closely linked with the objects of the Society, should not be neglected. I therefore beg to propose, that the Society may be pleased to fix an annual sum of some hundred rupees to enable the Librarian to improve the collection of Oriental works in the Library.

I have the honour to be, Sir,
Your most obedient servant,
E. ROER.

14*th January*, 1845.

Abstract of the List of Books received into the Library during 1844.

Academy of Natural Sciences of Philadelphia. Transactions, vol. ii. January and February 1844, No. 1.

Ditto ditto Proceedings, Nos 30-33.

Agricultural and Horticultural Society of India, Journal, vol. 2, Nos. 11-12, vol. 3, Nos. 1-2.

Annals and Magazine of Natural History, Nos. 77-83 and Nos. 85-89.

Athenæum, Nos. 855-858, and Nos. 861-883.

Ayeen Akbery, or the Institutes of Akber, translated by Gladwin, 2 vols.

Bombay Branch Royal Asiatic Society. Journal, No. 7, 1844.

Botanical Society of London, 1839. vol. i.

British Association for the Advancement of Science. Report for 1843.

Calcutta Christian Observer, vol. v. 1844, from January to December, 12 Nos.

Calcutta Literary Gleaner, vol. ii. Nos. 10-11.

Classical Museum of London, 1844, Nos. 2-5.

Forster, (C.) Historical Geography of Arabia. London, 1844, 2 vols.

Gayangos, (P. de) History of the Mahomedan Dynasties in Spain, vol. ii. London, 1843.

General Report on Public Instruction in the Bengal Presidency, for 1842-43, 1 vol.

Geological Society of London, List of the Members for 1843.

——— Proceedings, vol. 14, No. 96, and Index to vol. 3, No. 93.

Golingham, (J.) Meteorological Register at Madras.

Goodwyn, (H.) Memoir on Iron Roofing, Calcutta, 1844.

——— Ditto ditto plates.

Grey, (Hamilton) History of Etruria, part 1, 1 vol.

Griffith, (W.) the Palms of British India.

Heeren, (A. H. L.) Manual of Ancient History. Third edition Oxford, 1840.

Jameson's Edinburgh New Philosophical Journal, Nos. 69-72.

Jeffroy, (A.) Notes on the Marine Glue. London, 1843, Pamphlet.

Jerdon, Illustrations of Indian Ornithology, No. 1, Madras 1843.

Johnston, (K. M.) Report of the Secretary of the Navy.

Jones, (J. T.) Brief Grammatical Notices of the Siamese Language.

Lardner, (D.) and Walker Cabinet Cyclopædia. Electricity, vol. ii. 1844.

London, Edinburgh and Dublin Philosopical Magazine and Journal of Science, vol. 22, Nos. 147, 148; vol. 23, Nos. 159, 150, 153, 185; vol. 24, Nos. 156, 161.

M'Clelland (J.) and W. Griffith, Calcutta Journal of Natural History, 4 vols. Nos. 1-16, and Nos. 17, 18.

Madras Journal of Literature and Science, No. 30, June 1844.

Magnetic Observations from the Observatory of Bombay.

Naturalist's Library, Ichthyology, vol. 6, British Fishes, Ornithology, vol. 14, British Birds, 2 vols.

Napier, (W. F. P.) History of the Peninsular War, vols. 3-5.

Niebuhr (B. G.) History of Rome, vols. 4, 5.

Oriental Christian Spectator, vol. 4. No. 12. Second Series, Nos. 1-11.

Penny Cyclopædia, vols. 25, 26.

Piddington, (H.) Horn-book of Storms for the Indian and China Seas, 1 vol.

Prichard, (J. C.) Natural History of Man, 1 vol.

Ditto ditto Researches into the Physical History of Mankind, vols. 1-4.

Ram Chunder Doss, General Register of the Bengal Civil Service, from 1796-1842.

Register of the Singapore Tides.

Royal Asiatic Society of Great Britain and Ireland, 1843. Annual Report of the Council.

Royal Geographical Society of London. Journal, vol. 14, part 6, 1843.

Royal Irish Academy. Transactions, vol. 19, part ii.

Ditto Proceedings, 1841-42, part 6; 1842-43, part 7.

Royal Society of Edinburgh, vol. 15, part 2nd, 3rd Series.

Royal Society of London, Philosophical Transactions, from 1838-43, 6 vols. and part i. for 1844.

Shea, (and Troyer) Dabistan, or School of Manners, translated from the Persian.

Sketch of the Systems of Education, moral and intellectual, in practice at Bruce Castle School, Tottenham, London, 1839, 1 vol.

Slane, (Mac G. de) Ibn Khalikan's Biographical Dictionary, translated from the Arabic, vol. ii, Paris 1843.

Smith, (A.) Illustrations of the Zoology of South Africa, Nos. 18, 19.

Society of Arts, Transactions, vol. 54.

Society for the Encouragement of Arts, Manufactures and Commerce, premium for the sessions 1843-44.

Somerby, (B.) Thesaurus Conchyliorum, or figures and descriptions of shells. 1842-43.

Somerby, Conchologia Iconica, a Repertory of species of shells, pictorial, descriptive. London, 1843, 3 vols.

Taylor, (G. P. G.) General Catalogue of the principal fixed stars, from observations made at Madras in 1830-1843.

Troyer, Vide Shea.

Vetch, Inquiry into the manner of establishing a steam-navigation between the Mediterranean and Red Seas, London, 1843.

Wiseman, Letter on science and revealed religion.

Wood, (W.) Catalogue of a valuable collection of books in Natural History, arranged in classes according to the Linnean system.

Zoology of the voyage of H. M. Ship "Sulphur," during the years 1836-1842.

French.

Annuaire du Bureau des Longitudes, 1842, 1 vol.

Accroissement de la collection Géographique de la Bibliothèque Royale, 1841.

Bureau des Longitudes. Connaissance des temps des movements célestes pour, 1843-45, 3 vols.

Florival, (P. C. V. de) Moise de Khorene, texte Armemien et introduction Française. 1844, 2 vols.

Humboldt, (A. de) L'Asie Centrale. Paris, 1843, 3 vols.

Journal des Savants, Paris, April, 1843 to Aug. 1844.

Jomard, Notation Hypsométrique, P.

Mas, (S. de) Mémoire Sur l'idéographie Macao. 1844—P.

Ditto ditto, Vocabularie l'idéographique, P.

Quatremère Histoire des Sultans Mamlouks de l'Egypte. Tom. II, Paris, 1842.

Rafn, (Chr.) Mémoire sur la Découverte de l'Amerique. Copenhagen 1843, 1 vol.

Roberts, (G.) Voyage de Delhi à Bombay en 1841, 1 vol.

Societé Asiatique, Journal 3 me. Série. Nov. Dec. 1842, Tome 4. 4 me. Serie vols. 1-3.

Société de Géographie. Bullétin 2 me. Série, Tomes 18-19. Paris, 1842-43.

Ditto ditto, Extract du Rapport Annuel, 1839.

Societé Physique et d'Histoire Naturelle de Gèneve Memoires, 1841-42, 1 vol.

Societé Royale d'agriculture de Lyon.

Annales des Sciences Physiques et Naturelles 1838-1840, 3 vols.

Societé Royale des antiquaries du Nord, section Asiatique, mémoires, 1842-43, Copenhagen.

Tassy, (G. de) Saadi Paris, 1843,—P.

Walkenaer, (Baron de) Notice Historique sur la vie et les ouvrages de Major Rennell,—P.

Italian.

Hemsö, (G. de) Ultimi progressi de la Geografia. Milano 1843.—P.

Informe Sobre el Estado de las Islas Filipinas an 1842 Madrid 1843, 2 vols.

German.

Koenigliche Gesellschaft für die nordische Alterthumskunde. Iahresversammlung, 1842.

Lassen, (Ch) Zeitschrift für die Kunde des Morgenlands. Sechsten Bandes erstes Heft, 1844.

Leitfaden zur nordishen Alterthumskunde. Copenhagen 1837.—P.

Danish.

Annaler for nordisk old kyndighed, 1840-41, vol. I. 1842, 1843.

Latin.

Lassen, (Chr) de Taprobane Insula, veteribus cognita, dissertatio. Bonae, 1842.—P.

Hindoostanee.

Rafiel Hishab, 1 vol.

Zend.

Framje Aspandiarjei; The Zaina of the Parsis with Guzarati translation, paraphrase, and comment, 1843.

Sanscrit.

Yates, (W.) Nalayodaya by Kalidasa. Text and Translation. Calcutta, 1844, 1 vol.

Oriental Publications, &c. sold from the 1st of January 1844, to the 31st December, 1844.

	Rs.	As.	Ps.
Mahabharata, vol. I. 6 copies, vol. II. 6 do., vol. III. 6 do., vol. IV. 7 do.	260	0	0
Index to ditto, vol. I. 5 copies, vol. II. 5 do., vol. III. 5 do., vol. IV. 5 do.	20	0	0
Harriwansa, 9 copies, ...	45	0	0
Raja Tarrangini, 7 copies, ...	35	0	0
Naishada, 18 copies, ...	108	0	0
Sausruta, vols. I and II. 8 copies each.	64	0	0
Fatawe Alemgiri, vol. I. 2 copies, vol. II. 2 do., vol. III. 2 do., vol. VI. do., vol. V. 8 do., vol. VI., 8 do.	248	0	0
Inaya, vols. 2-4. 2 copies each,...	64	0	0
Khazanat ul Ilm ul Riazi, 6 copies, ...	48	0	0
Fawame ul Ilm ul Riazi, 6 copies, ...	24	0	0
Anis ul Musharrahin, 2 copies, ...	10	0	0
Sharaya ul Islam, 4 copies, ...	32	0	0
Epitome of the Grammar of the Beloochee languages, 1 copy, ...	1	0	0
Essay sur le Pali, 1 copy, ...	3	0	0
Anthologia Sanscritica, 2 copies, ...	8	0	0
Géographie d'Aboulfeda, 3 copies, ...	15	0	0
Macarius's Travels, 1 copy, ...	4	0	0
Memoir of Jehanguire, 2 copies, ...	8	0	0
History of the Afghans, 2 copies, ...	10	0	0
Travels of Ibn Batuta, 1 copy, ...	6	0	0
Lassen's Gita Govinda, 1 copy, ...	2	8	0
Lassen's Institutiones, 1 copy, ...	6	0	0
Asiatic Researches, vol. 16. 1 copy, vol. 19. p. I. 1 copy, p. II. 2 copies, vol. 20 p. I and II. 1 copy each....	40	0	0
Asiatic Journal, 8 Nos. ... ... — —	14	8	0
Total, Rupees, ...	1,076	0	0

ABSTRACT.

Account of the Oriental Publications delivered, sold, and in store, from 31st of July 1843, to December the 31st, 1844.

Mahabharata.

Vols.	I.	II.	III.	IV.
Found, ... Copies,	218	233	254	282
Delivered and Sold, ... ,,	20	20	26	21
Balance, ...	198	213	238	261

Index to Mahabharata.

	Vols.	I.	II.	III.	IV.
Found, ...	Copies,	392	396	392	323
Delivered and Sold, ...	,,	73	73	73	18
Balance, ...		320	323	329	305

Harriwansa.

Found, ...	... Copies,	409
Delivered and Sold, ...	... ,,	20
Balance, ...	... ...	449

Raja Tarangini.

Found, ...	... Copies,	275
Delivered and Sold, ...	... ,,	10
Balance, ...	...	265

Naishada.

Found, ...	... Copies,	197
Delivered and Sold, ...	...	30
Balance, ...	...	167

Sausruta.

	Vols.	I.	II.
Found, ...	... Copies,	261	308
Delivered and Sold, ...	... ,,	18	18
Balance, ...	...	243	243

Sanscrit Catalogue.

Found, ...	... Copies,	255
Delivered and Sold, ...	... ,,	6
Balance, ...	...	249

Fatawe Alemgiri.

	Vols.	I.	II.	III.	IV.	V.	VI.
Found, ...	Copies,	81	91	97	76	118	129
Delivered and Sold, ...	,,	12	12	12	24	25	24
Balance, ...		69	79	85	52	93	105

Inaya.

	Vols.	II.	III.	IV.
Found, ...	... Copies,	35	28	30
Delivered and Sold, ...	,,	12	12	12
Balance, ...		23	16	18

Khazanat ul Ilm.

Found, ...	... Copies,	385
Delivered and Sold, ...	... ,,	16
Balance, ...	...	369

Fawane ul Ilm ul Riazi.

Found, ...	... Copies,	393
Delivered and Sold, ...	,,	16
Balance, ...		377

Anis ul Musharrahin.

Found, ...	... Copies,	316
Delivered and Sold, ...	,,	12
Balance, ...		304

Sharaya ul Islam.

Found, ...	... Copies,	314
Delivered and Sold, ...	,,	16
Balance, ...		298

Persian Catalogue.

Found, ...	... Copies,	238
Delivered and Sold, ...	,,	6
Balance, ...		232

Asiatic Researches.

Vols.	3.	7.	8.	9.	11.	12.	13.	14.	15.	16.	17.	18.	18.	18.	19.	19.	19.	20.	20.	20.
Found, ...	3	1	3	2	1	5	30	47	56	98	213	69	151	46	26	96	235	12	129	141
Delvd. & Sold,	0	0	0	0	0	0	1	1	1	2	1	0	0	1	1	3	1	1	2	1
	3	1	3	2	1	5	29	46	55	96	212	69	151	45	25	93	234	11	127	140

Tibetan Grammar.

Found, ...	... Copies,	208
Delivered and Sold, ...	,,	11
Balance, ...		197

Tibetan Dictionary.

Found, ...	... Copies,	205
Delivered and Sold, ...	,,	11
Balance, ...		194

Dictionarium Latino-Anamiticum.

Found, ...	... Copies,	58
Delivered and Sold, ...	,,	11
Balance, ...		47

The Catalogue accompanying this letter was ordered to be published in the Proceedings, and upon the proposal of the President, seconded by the Secretary, it was resolved, that a supplementary Catalogue, to comprise all the works received since the last Catalogue of the Library was printed, be also prepared and printed.

Read the following letter also from the Librarian:—

To H. TORRENS, *Esq., Secretary, Asiatic Society.*

SIR,—I beg leave to inform you, that I can procure the second volume of Strange's "Elements of Hindoo Law," and the first volume of Crawford's "Indian Archi-

pelago at 8 and 5 rupees respectively. As the original price of Strange's Elements is 11 rupees per volume, and of Crawford's Indian Archipelago 8 rupees per volume, will you authorize me to purchase those volumes for the Library, in order to complete the above mentioned works.

I take this opportunity to submit to you the following list of valuable Oriental works, which I would suggest should be purchased for the Library :—

1. Die Zigeuner in Europa and Asien, von Dr. A. T. Pott. Erster Theil. Halle. 1844.
2. Kammavakya, liber de officiis sacerdotum Buddhicorum. Police, Latine. Auct. Fr. Spiegel.
3. Chr. Lassen, Indische Alterthums-Kunde. Ersten Bandes erste Hälfte.
4. Panini's Acht Bücher grammatischer Regeln, von Otto Böthlinck. 2 Bände.
5. Radices Linguæ Pracriticæ. Ed. N. Delius.
6. Radices linguæ Sanscriticæ. Ed. N. L. Westergaard.
7. Böthlingk, (D.) Erster Versuch über den Accent im Sanscrit.
8. Die Declination im Sanscrit.
9. Unadi Affixe.
10. 5 Upanishads aus dem Yayur, Samu and Atharba-Veda. Herausgegeben von L. Paley.

14*th January*, 1845. E. ROER.

Resolved—That the Secretary and Librarian be authorized to purchase these works as occasion may present. The work of Count Bijonsterna, entitled Theogony, Cosmogony, and Philosophy of the Hindoos, was also specially ordered to be obtained for the use of the Archæological Committee.

The Secretary presented specimen copies of Abdool Ruzzak's work on Suffee terms, edited by Dr. Sprenger, of which those half bound were considered the best for the presentation copies.

The following note was read :—

MY DEAR SIR,—My friend Colonel Stacy of the 43rd Regt. having requested me to make over to the charge of the Curator of the Asiatic Society the accompanying ancient Hebrew MS., I have the pleasure to send it per bearer, and shall be favored by your acknowledging the receipt of it.

Ballygunge, 11*th January*, 1845. ROB. WROUGHTON.

The MS. to which it refers was handed to the Rev. Dr. Hœberlin, for examination and report.

Read the following letter and paper from the Secretary to the Government of Bombay :—

(No. 3656 of 1844.)

To the Secretary to the Asiatic Society of Calcutta.

General Department.

SIR,—I am directed by the Honorable the Governor in Council of Bombay to request the acceptance by the Asiatic Society of Calcutta, of the accompanying six

gold coins, discovered in the village of Heeolee in the Malwan Talooka of the Rutnagherry Collectorate, and at the same time to forward a copy of a descriptive memorandum by the Secretary to the Bombay Branch of the Royal Asiatic Society.

Bombay Castle, 12th December, 1844. M. ESCOMBE,
Secretary to Government.

Notice by the Secretary of the Society on ten Hindie gold coins, found at the village of Hewli in the Southern Konkan, and presented by Government; also on a collection of gold Zodiac coins of the Emperor Jehangir.

The ten gold coins transmitted by Government, for the acceptance of the Society, weigh each — grains, and have generally, on one side, the figure of a lion, with an inscription below on Telagu letters, *Baliji Shri*, which may be translated prosperity to the *Bali*, and which are oblations of food offered, at the four cardinal points, to *Indra*, god of the firmament, *Yama* judge of the dead, *Varuna* the ocean, and *Soma* the moon.* Two of the coins are hammered, and quite plain on one side; having on the other, stamped symbols for the four preceding deities, indicated by letters, among which I recognize the Telagu letter *k* standing for *Yama*, and the cave c*h* for Soma. The centre symbol must therefore be intended for *Vivaswa*, or the sun. On the reverse of six of the coins we find written within a circle the word *Rudra*, a name for *Siva*; and on another of them, the Trisul, or emblem of Siva, with an inscription below in Deva Nagari or *Shrimanya Devaya* श्रीमान्यदेवाय *to the prosperous* god; this last is the newest of the series, and indicates the establishment of the Saivite worship.

In the McKenzie collection of Hindoo gold coins, two of them are enumerated as the *Sinha Mudra Fanam*, or the *Fanam* with the lion impression, without any further information being given regarding them. These, and the ones now under consideration, may, with much probability, be assigned to the successors of the *Andhra* kings of Telingana, the *Narapati* sovereigns of Warangal; who appear to have been originally feudatories of the *Chalukya* kings of *Kalyani*. This family is known by the name of the Kakataya princes of Warangal, who at the commencement of their career, in the end of the eleventh century of our era, were *Jains*. Their original residence was *Anumakonda*, from whence, sometime after Sâl 1010, A. D. 1088, these princes removed to Warangal, which became their capital, and represented the chief Hindu state of Southern India, till destroyed by the Mahomedans during the reign of Ghias-ad-din Toghluk of Delhi, Hejirah 721, A. D. 1321. The then reigning Prince of Warangal is called, in Colonel Brigg's translation of Ferishta, *Sudder Dew*, being an evident mistake for his real name *Rudra Deva*; whose possessions appear to have been bounded on the North-west by those of *Rama*, Raja of *Devagiri*, the modern Daolatabad.

The coins now submitted for examination, having on the reverse the name of *Rudra*, may have been struck during the reign of the prince just mentioned; but there are good grounds for assigning them a higher antiquity, or the beginning of A. D. 1100, as at this time the second of the *Kakataya* princes of Warangal, named *Rudra Deva*, adopted the *Saiva* in place of the *Jain* faith, and built many temples to *Siva* or Ma-

* See perpetual obligations of a householder in Wilson's translation of the Vishesu Purara, Quarto, p. 302.

hadeva, in order to expiate the crime of having killed his father. Only one decisively Saivite coin appears in this collection, and is the most recent of the series; all the others indicating the prevalence of the *Jain* practice of astrology, and the worship of the *Bali* or *Baliah*, which are sidereal spirits.

(Signed,) JAMES BIRD,
Secretary, Bombay Branch Royal Asiatic Society.
(True Copy,)
W. ESCOMBE,
Secretary to Government.

The Sub-Secretary stated, that he had received from Dr. Mouat the following letter, with the pamphlets thereiu alluded to. The pamphlets were ordered to be distributed to the Members of the Committee.

MY DEAR PIDDINGTON,—Mr. Latter, just before leaving for Arracan, requested to present the accompanying copies of his 'Note on Budhism' to the Asiatic Society, for the use of the Members of the Committee appointed to carry out the plans developed in the letter from the Honorable Court of Directors.

18*th January.* FRED. J. MOUAT.

Read the following letters:—

(No. 3076.)

From the Under-Secretary to the Government of Bengal, to H. TORRENS, ESQ. *Vice President and Secretary to the Asiatic Society, dated Fort William,* 11*th December*, 1844.

SIR,—With reference to your letter of the 7th March last, recommending on the part of the Asiatic Society, that certain books now in the Calcutta Public Library should be transferred to the charge of the Society, I am directed to forward, for the information of that body, the accompanying copy of a letter, dated the 4th ultimo, from the Curators of the Library.

At the same time, I am instructed to intimate that, though in the opinion of the Right Honorable the Governor, the existing arrangement cannot be fairly or properly disturbed without the consent of both Associations, yet His Excellency is inclined to think that, if the works in question are connected with Eastern Philology, they would be better placed in the Library of the Asiatic Society, than in the Public Library.

A. TURNBULL,
Under Secretary to the Government of Bengal.

From the Curators of the Calcutta Public Library, to A. TURNBULL, *Esq. Under Secretary to the Government of Bengal.*

SIR,—I have the honor to acknowledge, on the part of the Curators, the receipt of your letter, dated 15th April last, enclosing copy of a letter from the Vice President and Secretary to the Asiatic Society, and requesting us to report, for the information of Government, our willingness or otherwise to accede to the proposition for the transfer of the books therein alluded to, from the Calcutta Public Library to that of the Asiatic Society.

We beg at the same time to apologize for the delay which, by some singular accident, has occurred. With regard to the proposition of a transfer of the books, we beg to state, for the information of the Hon'ble the Governor of Bengal, that the books became the property of the Members of the Calcutta Public Library by a gift of the Bengal Government, confirmed by the Hon'ble Court of Directors, under certain engagements, which it is unnecessary at present to enter into, but which have been always complied with. As books of reference, we beg to observe that they are far more available to the public here than they can possibly be at the Library of the Asiatic Society, from the number of our subscribers, and the popular form of our Institution generally.

I am, &c.

(Signed) G. T. MARSHALL, *Curator,*
Chairman of the monthly meeting of Curators.

Metcalfe Hall,
4th Nov. 1844.

(True copy,)
A. TURNBULL,
Under Secretary to the Government of Bengal.

Resolved—That the following gentlemen, viz. :—

Dr. ROER,

Dr. GANTHONY,

S. G. T. HEATLEY, Esq.

and H. TORRENS, Esq. as Secretary, be requested to form a Sub-Committee for considering what interchange might take place between the Society and the Public Library, as to duplicate works, without reference to subsequent arrangements.

Read the following letter addressed to the Geological Society of London, and it was agreed that it would be proper to despatch at the close of every year, one of the same tenor to every Society or Editor, whose works are regularly received by the Society.

The Secretary, Geological Society of London.

SIR,—I am directed to acknowledge the due and regular receipt of your Transactions and Proceedings by the Asiatic Society of Bengal, and to express to your Society our best thanks for the same. Should any irregularity in the receipt of the Journal or Transactions (Researches) of the Asiatic Society of Bengal occur, our London publishers and Agents, Messrs. Allen and Co., will readily explain or rectify it.

We have to request you will be good enough to transmit to them the numbers of your Proceedings, noted on the other side, and your bill for them, as the most part have probably been duly received by us, but are lost.

(Signed) H. TORRENS,
V. P. and Sec. Asiatic Society of Bengal.

Museum, 20th Jan. 1845.

Read the following extract of a letter from Captain Phayre, B. N. I. to the Secretary, dated Sandoway, 2nd December 1844.

MY DEAR TORRENS,—I hope, before long, that I shall be able to offer a treatise on Burmese Astronomy, from the pen of the Rev. Mr. Stilson, a Missionary here,

who is fully competent to the task. I am sorry the coins (the Persian part of them) are undecipherable; the fact is, the inscriptions must have been cut by some ignorant person in Arrakan, with a few Persian letters scrawled for the name of the thing. Are the gold coins *(Elephant type)* from Cheduba?

Sandoway, December 2, 1844.

The Secretary presented a paper from J. Middleton, Esq. C. S., being Observations on the specific Gravity of sea-water, which was referred to the Editors of the Journal for publication.

As it was already late, the President suggested that it might be advisable to call a supplementary Meeting for such business as remained, and for the reports of the Curators; which was agreed to, and Saturday the 1st February being considered as he most convenient day, it was named for that purpose.

For all the foregoing communications and contributions, the best thanks of the Society were accorded.

Proceedings of the Supplementary Meeting.

As above noted, the Supplementary Meeting of the Society was held on the 1st February, at 7½ P. M.—J. Fulton, Esq., Member Committee of Papers, in the Chair, when the reports of the Curators were read as follows:—

REPORT OF THE CURATOR, MUSEUM OF ECONOMIC GEOLOGY, AND GEOLOGICAL AND MINERALOGICAL DEPARTMENTS, FOR THE MONTH OF DECEMBER.

Geological and Mineralogical.—Our zealous and indefatigable contributor, Lieut. Sherwill of the Behar Revenue Survey, has sent us a most valuable geological map of Zillah Behar, with three chests containing upwards of 350 splendid sized specimens of the various rocks and minerals, numbered to the localities marked on the map. Lieut. Sherwill's notes to accompany the specimens have not yet arrived, but I have deemed it right to bring forward this magnificent contribution this evening, that we may have the pleasure of thanking him, as he so richly deserves, at the earliest possible moment. If the Society think with me, I should deem it right that it should, in such manner as may be thought proper, bring to the special notice of Government this meritorious instance of an officer voluntarily adding so highly and so valuably to his particular duties; of which we may, I think truly say, that there is no example yet on record. It must not be forgotten, that the officers of the Revenue Survey have no light task, and that this addition to our knowledge of his district has been made by Lieut. Sherwill probably in the hours of relaxation and repose. I trust that his notes, with what we can glean from Buchanan, will enable us to construct some good sections; in which case, imperfect as they may, and as every thing short of a regular geological survey, must be, it will still be the best geological notice of any separate Zillah in India, and an invaluable example to others; one indeed, which I feel assured the Society will not allow to pass by without all the honour in its power to bestow upon it.

I present now my detailed report on the Aerolite, presented by Captain J. Abbott, which was exhibited at the October meeting. I have put it in the form of a paper for

the Journal, as these phænomena are of special interest at home on many accounts, and our Aerolite is of a very rare kind.

I mentioned in my former report, that we had written to the Collector of Candeish, requesting his assistance in procuring further information of the Aerolite, and more specimens if obtainable. I have now the pleasure of submitting his reply, which is as follows. The report will be incorporated with my paper.

H. TORRENS, *Esq. Secretary and Vice-President, Asiatic Society.*

SIR,—I have now the pleasure to comply as far as in my power lies, with the request contained in your letter of the 23rd November last, and to send you five pieces of the Aerolite to which you allude, with a statement from the parties who witnessed the fall of it.

If in this or any other matter I can be of service by furnishing information, or otherwise forwarding the views of your Society, I beg you will freely command me.

Candeish, June 6, 1845. J. M. BELL,

Collector of Candeish.

P. S.—The fragments of the Aerolite have been sent by bangy post; I shall be glad to hear that you have received them, and that they are of sufficient size to be of value.

Captain Latter, 67th B. N. I. has presented us with a very beautiful collection of minerals, being 128 good sized specimens and from first-rate dealers, (Mawe or Tennant?) some of which will be handsome additions to our cabinet, and others serve to replace inferior specimens or to shew varieties. Captain Latter has added to this very handsome donation a considerable number of Geological and Mineralogical specimens from Algeria; including some of copper, from the lodes now working on the flanks of the lesser Atlas by the French! and fossils, &c. from the desert between Suez and Cairo.

We should also place on record the following extract of a polite letter from Capt. Baker, B. E., to whom I have written to say that we should be most obliged by any thing from such a locality.

Secretary to the Asiatic Society of Calcutta.

DEAR SIR,

I passed through Calcutta lately on my return from Scinde, and had hoped to present to the Society some geological specimens from that country; unfortunately, however, my baggage had not arrived before I was obliged to leave, and it may even be sometime before I have an opportunity of sending them.

On the arrival of my baggage, you will however receive two small boxes of fossils from Lieut. Blagrave of the Sinde Survey.

28*th December*, 1844. W. E. BAKER, *Capt. Engineers.*

Museum of Economic Geology.—A specimen was handed to me at the meeting of January, marked as "a species of Asphaltum from the bed of the Namsay river near Jeypore, Upper Assam, presented by Mr. F. C. Marshall." It is unfortunately not Asphaltum, which will be a great treasure wherever it is discovered in any accessible locality in India, but cannel coal, apparently of a very fine quality. Our thanks are nevertheless equally due to Mr. Marshall for his very kind attention, and we shall be greatly obliged by specimens of everything he can send us; particularly if pitch-like or

earthy-looking substances of any kind, which melt and burn, and if they also effervesce with any acids, as strong vinegar or lime-juice, so much the better.

I have here also again the pleasure of referring to Lieut. Sherwill's active kindness in support of the objects of the Museum. I had written to him on the subject of the Corundum recently found and presented by Dr. Rowe, and in reply he sends us a set of specimens analagous to those which I had obtained from the bazar, but accompanied by the following very interesting account of the specimens and mines; which last were not known, I think, to exist in any locality north of the Nerbudda.

My dear Sir,—I have succeeded after some trouble in getting you specimens of Corundum, from a locale little known to Europeans; they were obtained from a hill in Lat. 24° 10′, Long. 83° 20′, about 20 miles S. W. from Vantaree, behind the table-land of Rhotas, in a province known as Singrowlee. The mines are worked once a year, when enough is worked out to supply the wants of the Mahajuns, who send bullocks to convey it away. From this spot the greater part of Western India is supplied. The following Nos. apply to the Nos. on the specimens.

No. 1. Goolabee, named from its rose colour, is considered the best.

No. 2. Mussooreea, named from its colour, as resembling Mussoor-dal (ervum lens) is 2nd in quality.

No. 3. Bhakra, from being of many colours, (greyish?) 3rd in quality.

No. 4. Teleeya, named from its resembling in colour, the seed of the *telee*, 4th in quality.

No. 5. Considered impure, being mixed with scales of Mica.

No. 6. Very impure, being mixed with crystals of (Zeolite?*)

In a short time I hope to be able to go to the spot myself, when you shall have a description of the place, rocks, &c. I *think* if you look amongst my Behar specimens you will find some corundum of the 1st or Goolabee quality, about No. 250 or 240.

Legend attached to the quarrying of the Singrowlee Mine.

"The rock, by the permission of the gods, is for one day, and one day only in the year, Corundum; during the remaining 364 days the rock is mere rock and of no earthly use." This is rather a clever story of the owner of the quarry! I should like very much to hear if you do find any Corundum amongst my Behar specimens.

W. S. Sherwill.

We received some time ago from Captain Williams the following letter and notice, with the small fragments (of a few grains in weight only) referred to in it.

H. Piddington, Esq. *Assistant Secretary to the Asiatic Society of Calcutta.*

My dear Sir,—I have had the pleasure to receive your letter regarding the Volcano near this place, and I will not fail to collect specimens of the stones, earth, &c. &c., on, and all around the hill, and send them up in the "Amherst."

As you have kindly offered me your services, I take the liberty of sending you four bits of stones sent out to me by a brother by the last Overland, who obtained them from a private in H. M. 4th Dragoons. It (the stone) is celebrated for its virtues in cleaning bridle bits, &c. and my brother wishes me to collect a quantity for him; but what the stone is, or where to be had, I am unable to find out, and shall feel obliged by your informing me. It appears from the Dragoon's memorandum that the natives of India (for he got it in this country) make idols of it. I fear the Dragoon is an *old*

* These are Fibrolite in small radiated nests.

soldier, and older traveller, and is imposing on my countrymen the untravelled Welsh. Please to return the stones.

Yours faithfully,

Kyook Phyoo, 14*th July,* 1844 D. WILLIAMS.

The following Memorandum accompanied Major Williams's letter :—

Direction for polishing Iron and Steel.

" Take about two drams of Samy stone, put in a mortar, powder it as fine as possible, then put it on a slabstone, or what painters do mix their paint on, then rub it down with sweet oil, (N. B.—The best of oil,) until it be as fine as milk, the finest the best. Then take a new piece of strong cloth or thick flannel, then soak it with the above mixture. Rub your irons with it; afterwards take fine shamois' leather with rotten stone or whitening and chalk, and it will show the highest polish ever known. The same rag will last six months without failing. Never attempt to put fresh stuff on the old rag, for the stuff will remain on the rag as long as it may last if taken care of. Keep it from wet and strong heat.

" Samy stone is found in several places in the East Indies, but the best we found is at Bombay, and most plentiful; we paid from 1-3 to 2-6 of English money per pound for it in India. The inhabitants makes idols of it of different figures, and paints it in red. There is none to be got in England, except what is in our troop; you can get some home if you know any person in India, or a sailor that trades to that country, as it may be sent or bought without duty, &c. There is several grooms in England that had some home after they had the receipt from us. For the above receipt I had five pounds, never gave it before under ten rupees; I have sent you two small pieces, and you can try one for experience, the other you may keep to prove what you may get again : my stock is getting very short at present, else I should send you more of it. Received 5 shillings.

Newcastle, March 28*th,* 1844. H. HALL, 4*th V. O. L. D.*"

As far as could be ascertained, from the small splinters I ventured to detach from the minute specimens sent, there is no doubt that the stone is a variety of Pagodite, which is almost all which can be pronounced of it now. I have carefully kept the remainder for comparison, and indeed have deferred reporting my examination of it, in the hope that some of the many persons to whom I have written would have been able to discover what this Samy stone—evidently *Swamy* (God) stone—is; but hitherto, I have heard of nothing approaching to it. The question nevertheless is of much interest, for the art of polishing metals is often one of high importance; and the use of an intermediate substance between the coarse polish of the Corundum or emery, brick or porcelain dust and the finishing effect of the rotten stone, as here described, is worth attention. The use of the common steatite in polishing, and as an anti-attrition ingredient has been long known; but the whole phænomena of polishing substances, and their effects on reflecting surfaces have yet been so little studied, that it is always proper that due weight be given to any fact which may lead to a useful practice.

The Secretary stated, that the suggestion of the Curator, respecting Lieut. Sherwill's labours, had been also mentioned at the regular Meeting, and fully approved of; it was resolved, a letter should be addressed to Government as proposed.

NO. MADRAS

CEYLON

NORTHERN HEMISPHERE

Chart

TO THE ELEVENTH MEMOIR

on the

Law of Storms

IN INDIA

being

The Storms in the Bay of BENGAL

AND SOUTHERN INDIAN OCEAN

of 26th Nov.r to 2nd Dec.r

1843

BY

Henry Piddington.

SOUTHERN HEMISPHERE

* Enclosed A.P.

FOR LIBRARY USE ONLY.

FOR LIBRARY USE ONLY